CITY OF LODI

COUNCIL COMMUNICATION

AGENDA TITLE: 1991-92 Appropriations spending Limit

MEETING DATE: June 20, 1991

PREPARED BY: Finance Director

RECOMMENDED ACTION: That the City Council provisionally set the 1991-92 Appropriations Spending Limit at **$33,441,797 as calculated using:**

1. The percentage increase *in* the California Per Capita Income; and

2. The greater of the percentage increase in the City's *own* population growth or the population *growth* of the entire San Joaquin County.

These figures were supplied *by* the California Department of Finance. The 1991-92 Appropriations Spending Limit may require adjustment if the County Assessor's Office provides data showing that percentage *change* in the local assessment roll from the preceding *year* due to the addition of local non-residential construction is greater than the percentage increase in the California Per Capita Income. The County does not have the ability to provide this information at this time.

BACKGROUND INFORMATION: Article XIIIB of the California State Constitution specifies that an annual Appropriations Spending Limit shall be established to place limits on the amount of revenue which *can* be spent *by* the *city.* In June, 1990, proposition 111 was passed which modified the earlier proposition 4 and the corresponding legislation *regarding* calculation.

The current legislation has *changed* the annual *growth* adjustment factors used in the calculation of the Appropriations Spending Limit- The City Council must choose between:

1. The population growth of the city; OR

2. The population growth within the County.

The recommendation of the Finance Department is to use the percentage which Will result in the highest Appropriations Spending Limit. The population growth of the County is higher in fiscal year 1991-92. The population growth *of* the City was higher during fiscal years 1987-88 through 1990-91.

APPROVED: Thos. A. Peterson

THOMAS A. PETERSON
City Manager

Currently, the county does not have the ability to provide the data for the change in non-residential assessment. Therefore, we have no choice but to use the California Per Capita Income as part of the calculation. In future years, the Council will also have to make a selection between these two items.

In calculating the 1991-92 Appropriations Spending Limit, the new growth factors were applied to the 1986-87 Appropriations Limit and each year thereafter. This did not change the limits for these years but allowed the accumulated growth in these years to be applied to the current year.

See attached Exhibit A for the appropriate growth rate factors and Appropriations Spending Limit calculations.

FUNDING: Does not apply,

Robert H. Holm
Finance Director

RHH:DW:ss

Attachment (Exhibit A)

Prepared by Diana White, Assistant Finance Director

EXHIBIT A

City of Lodi
Appropriations Spending Limit
Growth Factors/Calculations

GROWTH FACTORS:

Fiscal Year	% Increase Per Capita Income	% Increase City Population	% Increase county Population
87-88	3.47	5.72	3.33
88-89	4.66	4.96	3.32
89-90	5.19	2.52	2.20
90-91	4.21	2.26	2.23
91-92	4.14	1.19	2.64

CALCULATIONS:

FY 87-88: (1.0347)x(1.0572)=1.0939
(1.0939)x$22,654,787=$24,782,072

NOTE: $22,654,787 was 86-87 Appropriations Spending Limit.

FY 88-89: (1.0466)x(1.0496)=1.0985
(1.0985)x$24,782,072=$27,223,106

FY 89-90: (1.0519)x (1.0252)=1.0784
(1.0784)x$27,223,106=$29,357,398

FY 90-91: (1.0421)x(1.0226)=1.0657
(1.0657)x$29,357,398=$31,286,179

FY 91-92: (1.0414)x (1.0264)=1.0689
(1.0689)x$31,286,179=$33,441,797

RESOLUTION NO. 91-119

RESOLUTION SELECTING ANNUAL GROWTH ADJUSTMENT FACTORS AND ADOPTING A PROVISIONAL APPROPRIATIONS SPENDING LIMIT FOR 1991-92 IN COMPLIANCE WITH PROPOSITION 111, ARTICLE XIIIB OF THE CALIFORNIA STATE CONSTITUTION

RESOLVED, that the City Council of the City of Lodi does hereby select the annual growth adjustment factors and adopt a provisional Appropriations Spending Limit for 1991-92 in compliance with Proposition 111, Article XIIIB of the California State as follows:

I. 1991-92 Growth Factors Used:

A. Population growth within San Joaquin County of 2.64%

B. Growth in California Per Capita Income of 4.14%

11. Appropriations Spending Limit:

Total Appropriations Spending Limit for 1990-91 (allowing for accumulated growth due to new growth factors being applied and to FY 1987-88 through 1989-90)	$31,286,179
Increased by allowable San Joaquin County population growth of 2.64% multiplied by California Per Capita Income of 4.14%	
Therefore, the Appropriations Spending Limit for 1991-92	$33,441,797

The 1991-92 Appropriations Spending Limit may require adjustment if the County Assessor's Office provides data showing that percentage change in the local assessment roll from the preceding year due to the addition of local non-residential construction is greater than the percentage increase in the California Per Capita Income. The County does not have the ability to provide this information at this time.

Dated: June 20, 1991

I hereby certify that Resolution No. 91-119 was passed and adopted by the City Council of the City of Lodi in an adjourned regular meeting held June 20, 1991 by the following vote:

Ayes: Council Members - Pennino, Pinkerton, Sieglock, Snider and Hinchman (Mayor)

Noes: Council Members - None

Absent: Council Members - None

Alice M. Reimche
City Clerk

RES91119/TXTA.02J

Approved by City Council 4/12/89
Amended 4/11. 25/90 and 12/19/90

FIVE-YEAR PHASING SCHEDULE
CITY OF DAVIS PHASED ALLOCATION PLAN

The following schedule represents the initial schedule for the eligibility of approved projects to apply for residential building permits. The figures represent the maximum number of residential building permits which may be processed for each project with each fiscal year for single-family units. The multi-family unit allocations may be processed at any time during the five-year period.

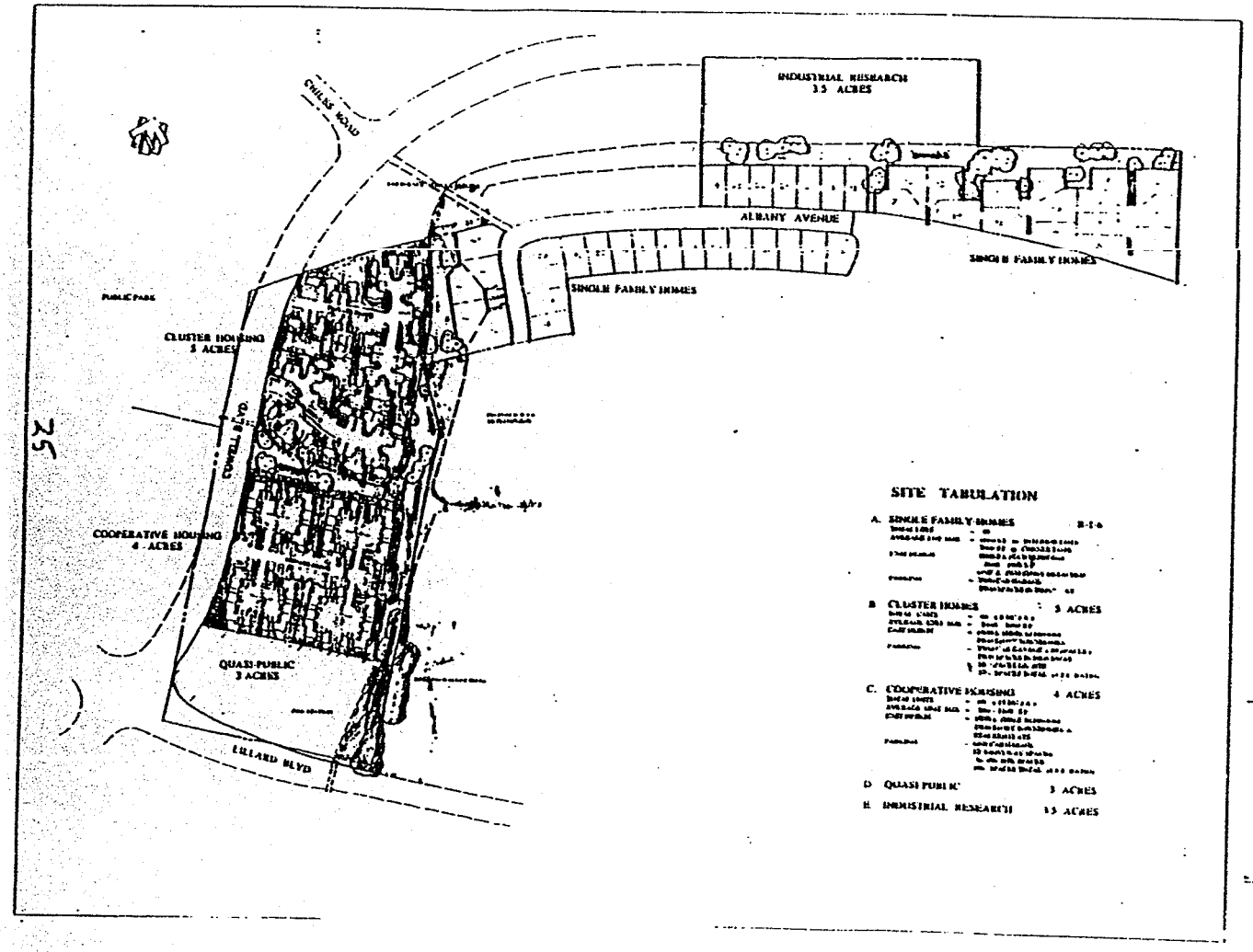
	HOUSING UNITS								
N. Davis Farms		20	4						24
Northstar	107	133	80	20					340
Wildhorse				75	85			104	264
Crossroads	85	135	85	70				100	475
Stonegate East	90	59	83					284	516
Mace Ranch	105	105	105			105	105[3]	210	735
Oakshade	30	124	72	45	17			203	491
Willowcreek	50	53							103
Waggener								130	130
MacDonald					45				45
FDC/Southfield		45	40						85
Sunnyside		30	38						68
Evergreen				25	25			119	169
Willowbank				13					13

[1] In 1989 only, building permits may be issued one month prior to the beginning of the 1989-90 fiscal year.

[2] Single-family units to be sold for less than $200,000: Crossroads, 50 units; Oakshade, 49 units; Sunnyside, 30 units.

[3] Living groups, co-housing, and housing developed by non-profits for permanent affordability, with no more than 150 such units annually.

[4] The City Council approved 105 units to either Single-family for 1995/96 or Multi-family for 1990/96.



COLUMBU
ARCHITECT

CHILES

PARK

DAVIS - CALIFORNIA

MASTER PLAN

EXHIBIT

FOUNDED AS
ASHLEY & NEUMILLER
JANUARY 1903

Neumiller & Beardslee
A PROFESSIONAL CORPORATION
ATTORNEYS AND COUNSELORS
FIFTH FLOOR WATERFRONT OFFICE TOWER II
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STOCKTON, CALIFORNIA 95203

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STOCKTON, CALIFORNIA 95201-3020
TELEPHONE (209) 948-8200
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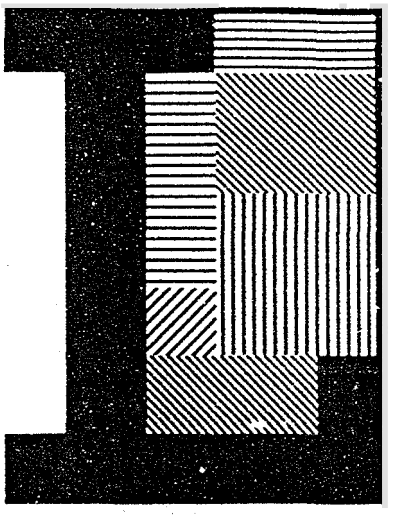
GROWTH CONTROLS AND HOUSING PRICES: SELECTED REFERENCES

NOVEMBER 1989



LAND LINES

LINCOLN INSTITUTE OF LAND POLICY

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THE LINCOLN INSTITUTE OF LANDPOLICY is a non-profit educational institution that enables policymakers, administrators, and other students to explore the complex linkages between public policies, including taxation. and land policy. and the impact of these policies cn major issues of our society. The major goal of the Institute is to integrate t!!. practice end understanding of land policy and those forces influencing that policy, especially taxation, which ha w significant impact upon the lives and livelihood of all people. The Institute is • tax exempt school providing advanced education in land economics, including property taxation, and offering challenging opportunities for learning, research and publication.

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Do Growth Controls Really Matter?

William A. Fischel
Professor of Economics
Dartmouth College

This article is abstracted from a comprehensive review of growth controls that Professor Fischel is now completing for the Lincoln Institute of Land Policy, with funding from the Urban Land Institute The study reviews the empirical evidence and findings of over 120 published studies.

Here Professor Fischel provides the conclusions that he has reached from the evidence. The full study, available from the Lincoln Institute later this year, critically reviews empirical studies on zoning and growth controls.

Yes, growth controls matter. Published empirical evidence shows that local land use regulations aimed at reducing growth have definite effects on land values and housing prices. Growth controls tend to raise the value of existing housing and sites on which development is still allowed, but can lower the value of undeveloped land or properties that might be profitably redeveloped.

This finding does not. by itself, imply that *growth* controls are efficient or inefficient. While many studies show that growth controls do have effects, few attempt *to* measure both benefits and costs of land use regulation. The few cost/benefit analyses that exist indicate that growth controls are likely to be inefficient. The major costs seem to be wasteful decentralization of employment locations and too much commuting.

The focus of the literature surveyed for this study was local government control of development, not national environmental policy. ***These* local controls include tightening of traditional zoning laws as well as moratoria on the extension of water and sewer lines and nonprice rationing on building permits.**

Causes and Consequences of Growth Controls

Recent growth management programs most frequently occur in two types of communities. Small, relatively affluent cities and suburbs are the typical locus of exclusionary zoning policies.[1] I have argued elsewhere[2] that the growth control movement was in part caused by judicial and state legislative attempts to limit exclusionary zoning. These limitations may have led the affluent communities that did not want to accept large amounts of low-income housing to adopt a fail-back policy of excluding all new housing. Growth controls are seemingly beyond judicial reproach on exclusionary grounds because they democratically exclude everyone. Indeed. many growth management programs go out of their way to mention that what little growth does occur should contain a low and moderate income housing component. Such benevolence may not offset the overall effects of restriction on the housing market.

Growth controls also seem to arise often in states in which citizen ballot initiatives are common. Direct democracy allows for little of the compromise and bargaining that goes on in representative government. Measures that provide a small benefit for a iarge number of voters and impose a iarge cost on an isolated group of citizens are more likely *to* pass in a plebiscite than in a legislature. Growth controls adversely affect a relatively small number of voters in the jurisdiction—landowners and business interests—while providing financial gains or community amenities to a large number of existing residents.

Courts of law might offset this political imbalance if they were to respond to developer complaints about such practices by requiring that the commucity pay just compensation for the devalued land. No state court, however, has intervened solely on the basis of landowner devaluation unless the errant regulation is so extreme that it ieaves the landowner with almost no use for his or her land. The consensus of legal observers is that the California courts have been the most accommodating to community regulation and the least sympathetic to landowner complaints.[3] This. combined with the widespread use of voter initiatives. has made

(Continued on pg 2)

WILLIAM A. FISCHEL is a Professor of Economics at Dartmouth College. where he has been a faculty member since 1973. Author of *The Economics of Zoning Laws: A Property Rights Approach to American Land Use Controls* (Johns Hopkins University Press, 1985). Recently, ha has organized a conference of legal scholars on the takings issue (papers published in the *Columbia* Law *Review*) end e conference of economists on land use controls (papers to be published in *Land Economics)*

Do Growth Controls Really Work?

(Continued from pg. 1)

California the undisputed leader in growth controls both in the 1970s and the 1980s.

The result of these two settings—small affluent communities or communities that adopt controls by referendum—is that growth controls are apt to go too far. In situations where some type of controls may be efficient in facilitating reasonable development, communities will tend to adopt controls that are too extreme. The cost of voting for extreme controls is not brought home to the voters or suburban councils because those adversely affected are either a small fraction of the electorate or not resident in the community at all.

Aside from their adverse effects on the cost of housing, inefficiently restrictive growth controls probably cause metropolitan areas to be too spread out. This is not to deny that growth controls may make development in *individual* municipalities more compact. Such local ordinances cause developers to go to other communities. The most likely alternative sites are in exurban and rural communities, where the political climate, at least initially, is more favorable to development. As these communities in turn become partly developed, the newcomers wrest the political machinery from the pro-growth farmers and business interests. Then these communities, too, adopt growth controls, sending development still farther from employment and commercial centers. Eventually, employment and commercial activities also disperse from traditional population centers as they find that employees and customers are harder to find.

The long-run effect of this is a lower standard of living. People will commute more than they otherwise would, which reduces their real incomes. Dispersion of residences and jobs promotes more automobile travel and longer trips, mating more congeation and pollution and eventually requiring more highway construction.

A more subtle consequence of inefficiently dispersed homes and businesses is the loss of agglomeration economies for firms. The advantages of operating a business in the proximity of many other businesses is one basis for urban economies. Location in a city allows firms to have access to a more skilled and flexible labor force. It also permits the face-to-face exchange of ideas, which promotee innovation. Forces that tend to disperse firms erode euch advantages and reduce potential output from the industry. Though advances in telecommunications and electronic media have induced at least some businesses to leave urban areas without any loss of efficiency, such firms are still the exception. Face-to-face contact is an essential ingredient of most growing businesses.

Conclusions

After reviewing the available literature, I am inclined to believe that most growth controls impose a net cost on society. The evidence that economists have provided over the years supports three conclusions:

- **Land use controls, especially overall growth control programs, are important constraints on the land market. This in turn affects housing values, especially in suburban and exurban communities.**
- Land use controls do provide some benefits that would be difficult to obtain under less coercive conditions. Abolition of zoning and related controls would create a demand for alternative controls It is not clear that these alternatives would be less costly to administer or more efficient in their effects than zoning.
- Growth controls and other aggressive extensions of land use regulations probably impose costs on society that are larger than the benefits they provide. The higher housing prices associated with communities that impose growth controls are more likely the result of wasteful supply constraints than benign amenity production The last conclusion is more tentative because only a few studios have addressed it in a persuasive framework.

NOTES

[1] Rolleston, Barbara Sherman, "Determinants of Restrictive Suburban Zoning: An Empirical Analysis." *Journal of Urban Economics* 21 (January 1987): 1-21.

[2] Fischel, William A. *The Economics of Zoning Laws: A Property Rights Approach to American Land Use Controls.* Baltimore: Johns Hopkins University Press, 1985. chapter 15.

[3] Ellickson, Robert C.. and A. Dan Tarlock. *Land Use Controls: Cases and Materials.* Boston: Little, Brown, 1981, page 75.

CASE IN POINT

Capitalization of Regulations in Land Values

A study of growth controls in Fairfax County, Virginia, provides good evidence of the effects of controls on land values. For a 1974 unpublished study on "Land Prices and Factor Substitution in the Metropolitan Housing Market" (Urban Institute working paper 1207-24), George E. Peterson obtained a sample of almost all of the vacant, residentially zoned parcels that sold in Fairfax County during the period 196373. He estimated price per acre of each parcel with and without the zoning constraints included. The addition of zoning constraints showed that zoning influences land values.

Peterson calculated price per acre effects by distance. He found that on land next to the central business district (CBD), there was a seven-fold price difference between land zoned for 20 units per acre and land zoned for one unit per acre. On land fifteen miles from the CBD, this differential shrunk to "only" a three-fold difference between 20 units per acre and one unit per acre.

This answers one objection to zoning studies. which is that even in the absence of zoning. lots would be larger in the suburbs. This is true, but in Peterson's sample, the large minimum lot sizes were still a binding constraint in the farther suburban areas of the county. Moreover, this finding shows that restrictive controls applied to a large fraction of suburban land can have significant effects on urban structure, pushing development to remote locations as close-in development is precluded.

Peterson's observation period overlapped the beginning of Fairfax County's sewer moratorium, which began in late 1972. Peterson found that by 1973, the sewer moratorium's effects radically changed his model's estimated effects. Having a grandfathered and thus permissible sewer connection pushed the value of a lot way up, while the implicit value of other characteristics. such as proximity to the CBD, actually fell. Even his measure of permitted land use intensity, the zoning variable, became much less significant. This suggests an important override effect of growth controls. The existence of new controls map reduce the apparent importance of old controls. such as traditional zoning.

FROM: "DO GROWTH CONTROLS REALLY MATTER?" By William A. Fischel

CITY OF LODI

HOUSING ELEMENT

PRINCIPLE HOUSING FINDINGS

STATEWIDE

- An average of 315,000 housing units need to be built annually through 1985.
- Approximately 4 percent (365,000) of existing housing units need to be replaced.
- Nine percent (860,000) of existing housing units need to be rehabilitated.
- 23% of all low income households pay more than 25% of their income for housing.
- The median price of a home in California in 1980 was $97,961 while nationwide the median price was $62,060.
- 430,000 households are overcrowded.

The following conditions contribute to California housing problem:

- The post-war baby boom generation is moving into the household formation period.
- Net immigration into California is on the rise.
- The number of households has increased due to high divorce rates and professional men and women marrying later.
- Housing lots have become increasingly scare in California's metropolitan areas.
- High inflation has caused savers to turn to other investments, thus making mortgage funds from banks and savings and loans scarce and available only at high interest rates.
- Land use regulations, permits and everchanging building standards are increasing housing costs.
- Californians now pay an average of 37% of their income towards house payments. (Nationally, house payments average 24% of income).

1. SOURCE: Cal Tax Research Bulletin, October 198i pg. 3

MEASURE A

THE GREENBELT INITIATIVE

On August 25, 1981, the voters of the City of todi approved an initiative ordinance which eliminated the City's Planned Urban Growth Area from the Land Use Element of the General Plan. The effect of this Ordinance was to establish the new urban growth boundary at the city limits as shown on Exhibit A. At the present time, annexation of County property to the City for urban development purposes is not possible without an amendment to the Land Use Element of the General Plan.

The effects of this initiative upon housing cannot be determined at this time. It has affected the assumptions concerning housing since properties once considered potentially buildable are now excluded. If construction is to occur, it will be limited tc those areas already within the City limits. Any direct relationship between the Greenbelt Initiative and fluctuations in construction activity cannot be proved due to innumerable other variables which include interest rates, availability and development of land in nearby areas, and weather conditions.

It is anticipated that as the amount of vacant City land decreases, two things will occur:

1. The price of remaining vacant land will increase, and

2. The development that will occur, in all probability, will be at a higher density (units per acre) due to increased land costs.

THE WAR AGAINST GROWTH HEATS UP

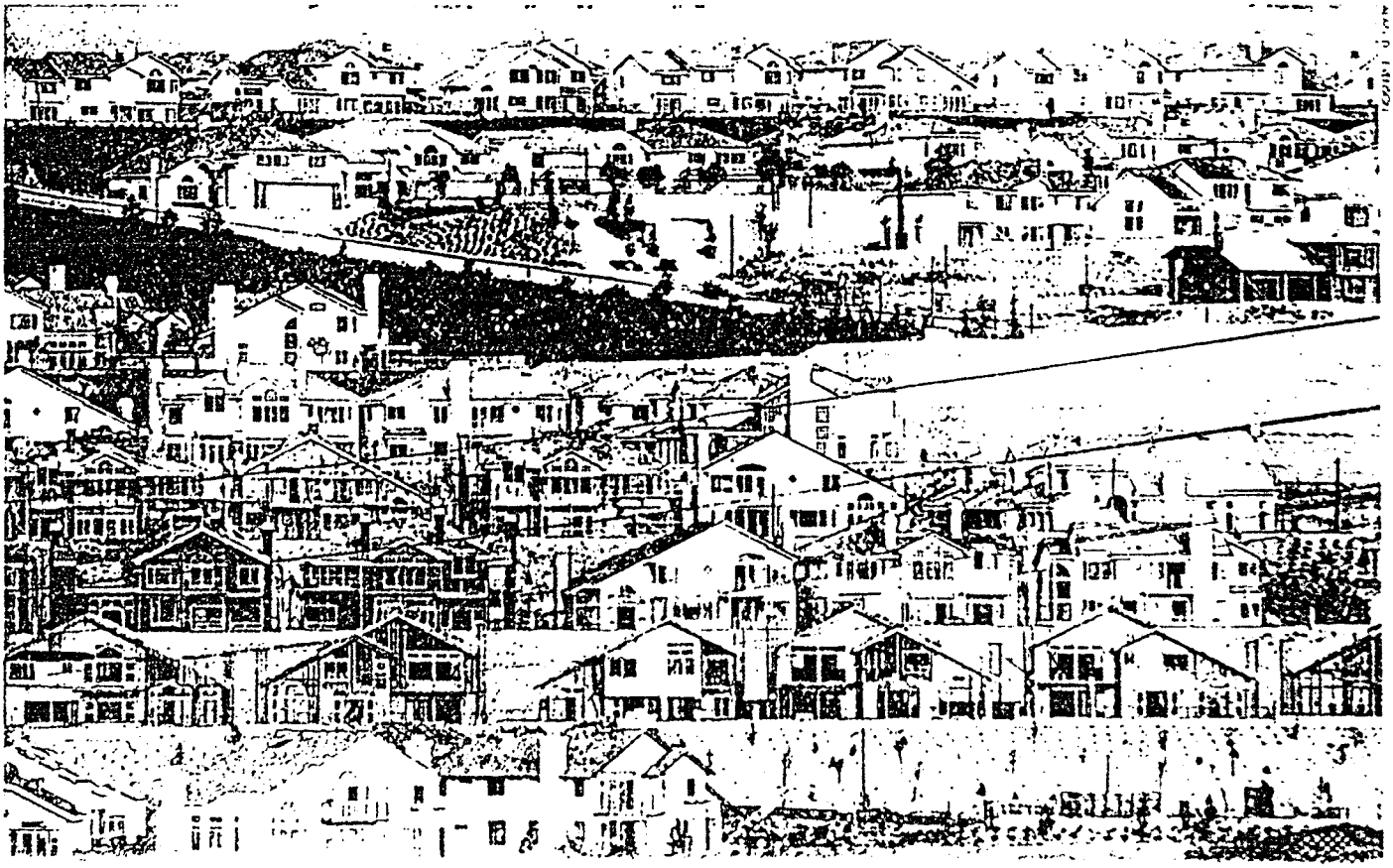
Put out by traffic jams; opponents of development in Southern California are stymieing builders. The effort may backfire, but the movement is spreading. ■ *by Brian O'Reilly*

THE LONG-RUNNING **ROOM** in Southern California is the **stuff** most chambers of commerce can **only** dream of: a soaring population, office buildings sprouting everywhere. and prices on some single-family homes climbing in value by more than $2,000 a week. **But** lately something has changed. Growth isn't such a kick anymore. Increasingly it's looked upon as a threat to a pleas**ant** and prosperous way of life, **and** as something to **be** resisted. The growth-control movement that has resulted jus: may be the harbinger **of** a national trend.

For much of the population of California. **and** particularly that of the **vast** mountain-ringed Los Angeles basin. economic growth now conjures up visions of stupendous traffic **jams,** overflowing sewer systerns. and pollution-filled air. The natives are growing rebeltious. In 1986.69% of the voters in Los Angeles approved a plan to slash by half the allowable density of future commercial and industrial buildings in most *of* the city. Last year a slow-growth candidate won a seat on the Los Angeles city council, defeating the council president. Across California 14 *of* 20 growth-control initiatives carried the vote in 1987. Eight of ten cities in Ventura County. just west **of** Los Angeles, have passed slow-growth measures in recent years. In all. 57 cities and eight counties in California have voted to limit growth. according to Madelyn Glickfeld, **an** urban planning consultant in Malibu.

"There was a time when Los Angeles **was** going forward and people wanted growth," says Sandy Brown. a physician's wife in Westwood, an upscale neighborhood that includes the campus of UCLA. But then a few years ago. Brown stared ***out*** her kitchen window and saw **a** bulldozer pulling **down** yet another home nearby to make **room** for apartments. "All of a sudden I wid to myself, 'What is **going** *on* here?"' She **proceeded** to help **create** Friends of Westwood, a neighborhood as-

Massive housing projects forced into areas far from where residents work have led to jammed Riverside and Orange County freeways.



Sharon Browning tries to keep the peace.

sociation that has become the scourge of developers "For years growth didn't intrude on my comfort zone,' says Brown. "But now it's become an infringement on my way of life."

SUCH SENTIMENT in favor of stowing or halting growth could prove a more virulent national movement than the tax reform measures that began in California with Proposition 13 in 1978 and spread to many other states. "No-growth is more fundamentally grass roots than Proposition 13," says Dwight Worden. a Solana Beach, California. attorney who has written nearly a dozen growth-control measures for different ballots. "Proposition 13 had a charismatic leadcr in Howard Jarvis," observes Worden. "This movement has no single leader. It is spontaneous in city after city."

Less vigorous strains of the antigrowth virus are already flourishing around the country in parts of New York. Virginia. and North Carolina. Former U.S. Senator Paul Tsongas of Massachusetts is publicly opposing uncontrolled growth on Cape Cod, and a senior aide to Governor Thomas Kean in New Jersey declares growth management the "biggest looming public policy issue in the state." But few regions have ever succeeded in using this concern to generate support for useful. comprehensive planning. J. Ronald Terwilliger, head of Trammell Crow Co.'s residential division, the biggest builder of apartments in the country, notes that antigrowth feeling was rare ten years ago. "Now," he says, "of the 60 cities where we operate, we see it in about half."

If you go back to the 1970s, you can find some precursors of the present drive for slower growth. The movements then ostensibly were prompted by concern for the environment. but sometimes were just disguised opposition to construction of low-income and multiracial housing. which opponents thought were a threat to properry values. The currenr sentiment, on the other hand. more often stems from immediarc and infuriating problems created by rapid commercial or residential development, says Harvard economist Joseph Kalt: "This time it is the reality of inadequate roads. sewers. water systems. and other infrastructure."

Across the country citizens have responded in ways cften heavy-handed. City councils and planning authorities are being pressured into forcing developers to pay every nickel of the cost of the added public services that their projects make necessary. This usually means that new businesses and new-home buyers wind up paying just that much more. Ballot measures have also imposed severe and inflexible limitations on new construction. Such extreme steps reflect a deeply felt resentment—often justifiable—that citizens have lost control of their local governments to developers.

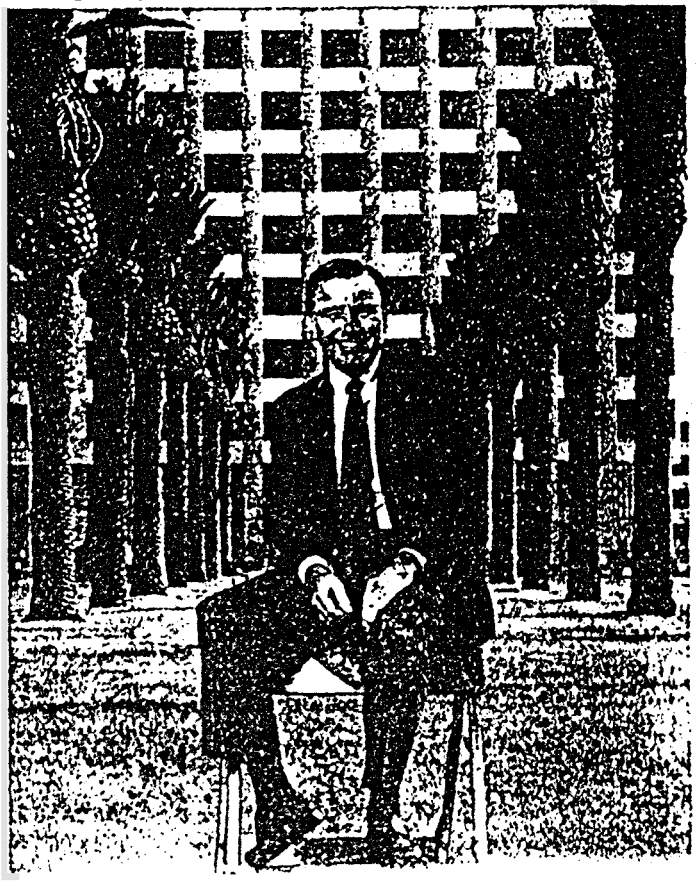
"It's like people in a lifeboat agreeing to save themselves by not letting anyone else on board."

For all the seriousness of the conditions that spark it, the push to slow growth can end up causing severe problems, even for the people behind the movement. The short-term result of limiting growth in a community is often to create a housing shortage, sending home prices shooting skyward and forcing many of those with jobs in the arm to live far away. This only dogs highways all the more. Typically such initiatives curtail the growth of housing more than they do any increase in the number of jobs, compounding the problem. Ultimately, a community can price itself out of business expansion, and in fact drive some businesses out, leading to a loss of tax revenues and deterioration of services and property values. As young workers are forced to live elsewhere, employers leave to pursue them.

The movement also sets up a wrenching conflict between the haves and the have-nots. "It's like people in a lifeboat agreeing to save themselves by not letting anyone else on board," says Frank Mittelbach, a professor of urban economics at UCLA. "The people in the water should have a vote."

In Los Angeles considerations as diverse as geography and taxes have come together to push slow-growth sentiment onto fast-forward. The five-county Los Angeles area, with its beaches and good weather, has attracted many new residents anxious for a more pleasant life. Between 1975 and 1987 the population of the met-

Developer Ray Watson says his company's costs have soared.



ropolitan area grew rapidly, adding almost three million people, 22 times as many as the metropolitan New York area gained. Los Angeles also has become a prime example of urban sprawl—95% of the region's jobs are outside the downtown area.

Even as the region has boomed, its ability to handle growth has diminished. Since the mid-19705, California has fallen to 49th among the 50 states in per capita spending on roads. Adjusted for inflation. nationwide federal spending for many infrastructure programs has decreased since 1980. At the Same time. the California tax initiative, Proposition 13, has limited property taxes on homes that have not been sold since 1978. Still other measures severely limit what a municipality can spend even if it is growing rapidly.

Nowhere is the pace of development more visible than in southern Orange County. down the coast about 50 miles south of downtown L.A. What not too tong ago were vast ranches still largely intact from the rime they were granted to settiers by the King of Spain, now crawl with bulldozers and earthmovers. Even in the face of antigrowth campaigns, vast stretches of hillside are being stripped bare for construction.

A double whammy is at work here: Those Proposition 13–style tax-cutting measures have wound up tempting many financially desperate municipalities to ignore good planning in pursuit of another source of tax revenues–commercial growth. "Proposition 13 is driving changes in land use," says C. Bradley Olson, an executive at the Irvine Co., which owns and is developing a 100-square-mile tract of land in Orange County. "The city of Costa Mesa near here gets huge sales taxes from a big shopping center it allowed there. But people from all over drive there. so Costa Mesa has huge traffic problems."

Sometimes the hunger for tax revenues is almost comical. To win city approval for a big project on its land in Tustin. the Irvine Co. had to agree lo include a dozen automobile dealerships in its plans so Tustin could colkct sales taxes on all the new cars sold within its borders.

More often towns pursue developers of high-rise office buildings while vigorously opposing new housing, which would require adding expensive new municipal services such as schools. "There is an absolute imbalance of jobs and houses," says John Martin. the Jrvine Co.'s head of residential marketing. "There has been an average of 53,000 new jobs a year created in Orange County for the last five years. and for that we should have built 42,000 housing units. But at tops, Orange is adding only 20,000 units a year." As a result, workers clog the freeways, driving long distances to get to work. "The commute to Riverside used to rake 40 minutes during rush hours." says Martin. "Now it takes 2% hours." Talk about lifestyle.

"It was socialism for the wealthy, an attempt by developers to put the cost of their sins on the public."

Infrastructure problems dog outlying areas too. With planning commissions there less sensitive to the growth issue, builders are able to put up massive housing developments in what was previously untouched terrain. packing the units together as tightly as if they were in the middle of a city. In some big developments south of the Irvine properties. one noteworthy amenity is in short supply: main roads. Commuters froni thousands of homes are funneled into a handful of streets before reaching the nearest freeway.

With frustration over growth mounting, developers usually feel the heat, and no one is turning up the temperature more vigorously in Orange County than Tom Rogers, who has emerged as an unlil leader of the slow-growth movem there. Rogers, 63, a small-scale shopp center developer himself and a forr chairman of the Orange County Repu can Party ("I'm about as right wing you can get"). proudly displays au graphed pictures of Ronald Reagan on wall. To drive with him through bulldo: and newly developed areas of Orai County as he points out monoton rows of houses and clogged intersecti is to see the full fury aimed at develop "They're greedy bastards." he fum "Thugs in three-piece suits."

Tom Rogers battles against developers.

Rogers's transformation from grov booster to basher follows a fairly comm pattern. "I used to be part of that grow is-progress crowd," he explains. "But changed when the government showed couldn't plan for growth." Orange Cour traffic already was dreadful in 1984 wh county supervisors proposed a $5 billi transportation improvement program be financed by a sales tan increase tl required voter approval. Rogers argu that the major beneficiaries would be c velopers, who would use the new roads justify new development. "It was soci. ism for the wealthy, an attempt by dev opers to put the cost of their sins on t public." says Rogers, who pulled togeth environmentalists. open-space enthusias antitax groups, and others to oppose t. measure.

WHEN THE SALES TAX lc by more than 2 to 1, Roge figured that was a message government officials to slc the pace of development. "Instead, th. kept right on just like they always did." } says. In 1987 he began circulating petitio for an elaborate Citizens' Sensible Grow and TrafficControl Initiative, which esse. tially required developers in Orange Cou ty's vast unincorporated areas to provi roads and public safety facilities for the projects. His measure was vigorously o posed by builders and lost last June. B polls in Orange County show that tw thirds of the voters continue to be in fav of slowing growth.

The combination of overburdened i frastructure and increasingly sophisticat antigrowth groups is forcing big chang in how developers do things. In the S Fernando Valley to the north of dow town Los Angeles, Jack Spound faces bizarre chore if he is to obtain an exem

REPORTER ASSOCIATE Kate Bullen

tion from the city's limit on new Sewer connections. So that his proposed office project won't add to the strain on the system. he will refit 8,000 toilets anywhere in Los Angeles with plumbing that uses three gallons per flush instead of the usual five. To overcome the opposition of homeowners near his proposed buildings. he hired Sharon Browning. a former social worker with a blossoming career in helping developers work with slow-growth groups. Browning persuaded Spound to go door to door through the neighborhood asking how he could change his design to make it acceptable. He's gained support but still awaits approval by the planning commission.

In Los Angeles, Friends of Westwood brought a landmark suit that focused on a proposed 26-story office tower, winning a ruling from the state court of appeals that the city has to assess the environmental impact of major projects before issuing building permits. Though the development company. Center West, had won zoning approvals for the office, its president. Kambiz Hekmat, negotiated an agreement with Friends of Westwood to cut the building's size by 18.5%. In addition, the city is requiring that he "plant, water, and prune the trees I put on the sidewalk," says Hekmat. That's nothing: As part of settling a dispute over parking at a new hotel near Beverly Hills, the owners agreed to pay $250,000 to Friends of Westwood and other slow-growth groups, money that presumably can be used to finance growth-control efforts against other new projects.

Developers around Los Angeles routinely find themselves picking up the tab for much of what municipalities once provided. Some have been forced to donate land and build new firehouses, police stations, even city halls, in order to win municipal approval for their plans. In parts of Orange County there is talk that developers may soon have to pay the salaries of policemen and firemen made necessary by their projects. Orange County forced the Irvine Co. to build a $45 million, six-lane road to accommodate a planned 2,600-unit community. Normal planning would call for two lanes for that size community.

"In the long term these antigrowth areas become elite communities without economic dynamism."

The cost of meeting such requirements is staggering. For a new business center, the Irvine Co. is paying $225 million for road construction and improvements. Says vice chairman Watson: "In 1963 improvements on land cost about $15,000 a acre. Now it costs $250,000 an acre."

ANTIGROWTH movements may be emotionally satisfying to the participants, but the eventual outcome can be a disaster. "No-growth movements hurt the people who wanted them," argues professor Kenneth Rosen, chairman of the Center for Real Estate and Urban Economics at the Uni-

Earthmovers strip the hills bare to prepare for more building in southern Orange County.

versity of California at Berkeley. "Th have a negative effect on the local econ my as firms relocate and real income go down. In the long term these antigrow areas become elite communities witho economic dynamism."

Trying to send newcomers elsewhe probably sounds just fine to slov growthers, but it won't solve Southern C ifornia's problems. Only one-third of t region's projected growth will come fro migration. The rest will derive from a hig birthrate. Even if Southern Californiar put a wall around the place, the populatio would grow by three million—equal to ar other Orange County—in 22 years. Failin to provide housing to accommodate suc growth simply drives housing prices sky ward. In a study of San Francisco–area mu nicipalities, housing costs in communitie that passed growth-control initiatives ar 30% higher than those that did not, say Rosen.

IN THEORY expensive or infrastruc ture-short surroundings should driv unwanted residents away. Trouble i it doesn't happen that way, observe Robert Paulson, managing director o McKinsey & Co.'s Los Angeles office an head of a chamber of commerce study o growth. "It's the rich and the young wh can move out to follow jobs," says Paul son. "The poor, the elderly, the immi grants, the people who need the mos services, are the ones who remain." Com panies eventually pull their operations ou of a slow-growth region to find suitabl workers living in lower-cost areas. Ac cording to a University of Southern Cali fornia study of growth-control efforts, i the Los Angeles region reduced housin growth by 15% and the rate of new com mercial space by 25%. unemploymen would double in the 1990s.

Unlike the environmental movement which was arguably more altruistic, slow growth has a distinctly selfish. "sock it to the newcomers" side to it. That means that in- convenient changes in lifestyle that migh help accommodate even carefully planned growth—car pooling, say, or recycling waste—will be slow in coming. The same spirit, but on a grander scale, will likely get in the way of coordinated regional solutions to planning problems. "Everyone wants to see it happen," says Ruth Galanter, the slow-growth candidate elected to the Los Angeles city council last year, "but without giving up their prerogatives."

Public Affairs Report

Bulletin of the
INSTITUTE OF GOVERNMENTAL STUDIES

EUGENE C. LEE. *Director*
HARRIET NATHAN. STANLEY SCOTT. *Editors*

UNIVERSITY OF CALIFORNIA, BERKELEY

Vol. 21 October 1980 No. 5

GROWTH IN CALIFORNIA: PROSPECTS AND CONSEQUENCES

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Introduction

Several factors influence California's growth in employment, population 2nd housing supply. These three elements are interrelated so that they act upon each other, and are acted upon in turn. To learn more about these interactions, we propose models and projections highlighting changes already taking place, and discuss policy options that can help encourage future change in desirable directions.

Between 1972 and 1979 the California economy experienced extremely rapid employment growth (3.7 percent annually), while population growth was substantially slower (15 percent).' Consequently, during that period the gross labor force participation rate (total population divided by the civilian labor force), went up from 42 *to* 48 percent. We assume that the participation rate will continue to increase in the next two decades, although more slowly. But these increases cannot continue indefinitely, because obviously the civilian labor force cannot exceed total population. Further, basic demographic factors will prcbably keep the gross labor force participation rate from rising much beyond 55 percent, since about 35 percent of the population is either over *64* years or younger than 17.

When the gross participation rate is constant the labor force and population must necessarily grow at identical rates. Therefore, if the high employment growth trend of 1972-1979 were to continue into the future for perhaps 20 years, population growth would have to accelerate rapidly. (One implication of this alternative is staggering: a continuation of the 1972-1979 employment growth rate would yield a population of *52* million people in California by the year 2000, contrasted with current estimates projecting about 30 million by the turn of the century.) On the other hand, if the comparatively low population growth of the *1970s* were to continue for the next *20* years, employment growth would have to slow down dramatically. In short, something has to give.

Current policies are often at cross purposes; some try to promote job growth, while others try to restrict population growth. As long as employment goes up much more rapidly than population, however, these policies do not outright conflict. But when it becomes more difficult to increase the number of workers in a given population, the dilemmas will become acute. Thus strong employment growth under those conditions will lead to strong demographically based demand for more housing space. But land-use restrictions, designed to preserve environmental quality, tend to limit housing supply. In combination, these and other factors (e.g., inflation) stimulate powerful forces raising home prices, producing extraordinarily high prices in most major urban areas of California. In such circumstances. can we develop policies that will provide for adequate and affordable housing for many more California workers and residents, while still preserving environmental quality? Our study examines the magnitudes of pressures that seem likely *to* become much more intense between now and the turn of the century.

What follows is divided into several sections. First comes a discussion of the recent history of employment and population for the state, and all 17 of its standard metropolitan statistical areas (SMSA's). Next *is* a brief discussion of state and local legislation for environmental protection that has worked to restrict the supply of housing. This is followed by a section discussing the implications of high employment growth and land-use restrictions with respect

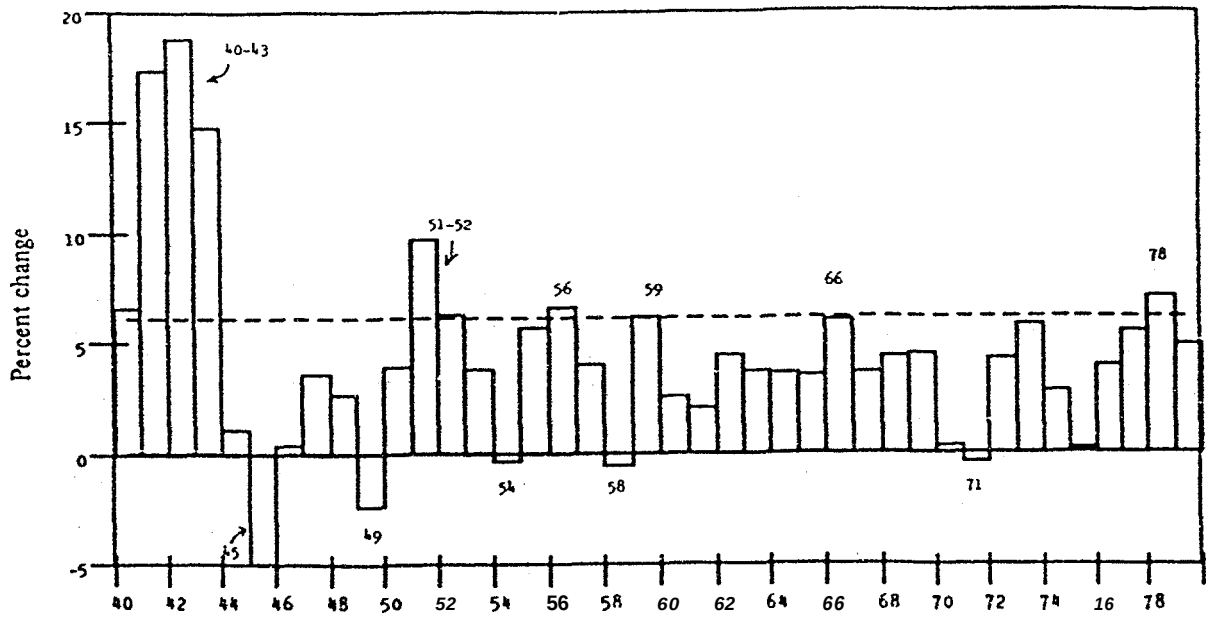
CALIFORNIA POLICY SEMINAR

The California Policy Seminar was established in 1977 as an experimental program in University-state government cooperation on the study of longer-term policy problems. Chaired by UC President David Saxon. the Seminar membership includes the Governor. President Pro Tempore of the Senate. and Speaker of the Assembly, plus other designated governmental and University appointees. Each year the Seminar commissions a number of research projects. selected from among research proposals suggested by University faculty members. Chosen projects are funded at 150,000 each. for work extending over a *two-year* period. This issue of the *Public Affairs Report*, the first to feature research sponsored by the California Policy Seminar, summarizes a longer technical report for a general audience. Copies of the technical report are available at cost from the Institute of Governmental Studies while supplies last.

ISSN 0033 3417

Figure 1

Job Growth in California, 1940-1979
(Annual Percent Change in Non-Agricultural Employment)



Source: See end-note 1.
Dashed line denotes 6 percent growth to show high growth years.

to housing prices, using a model that links house prices and employment growth. Next are 20-year population and employment projections for California and its 17 SMSA's, followed by policy implications of the analysis, and a few concluding comments.

Employment Growth and Population

Typically California has experienced its most rapid employment increases during wartime. The rapid increase in the late 1970s, however, was not associated with a sharp escalation in military expenditures. (Figure 1 charts changes in nonagricultural employment for 1940-1979.) The fifth fastest growth in employment occurred in 1978, a striking occurrence because it came before the increase in military spending associated with events in Iran and Afghanistan.

Job opportunities in California affect in-migration to the state, and net in-migration is linked with the difference between the California unemployment rate and the U.S. unemployment rate (see Figure 2). Thus in the early 1960s, when there was no unemployment rate differential, approximately 300,000 people a year came to California, and in the early 1970s when the California unemployment rate exceeded the U.S. unemployment rate by 3 percent, net in-migration approximated zero.

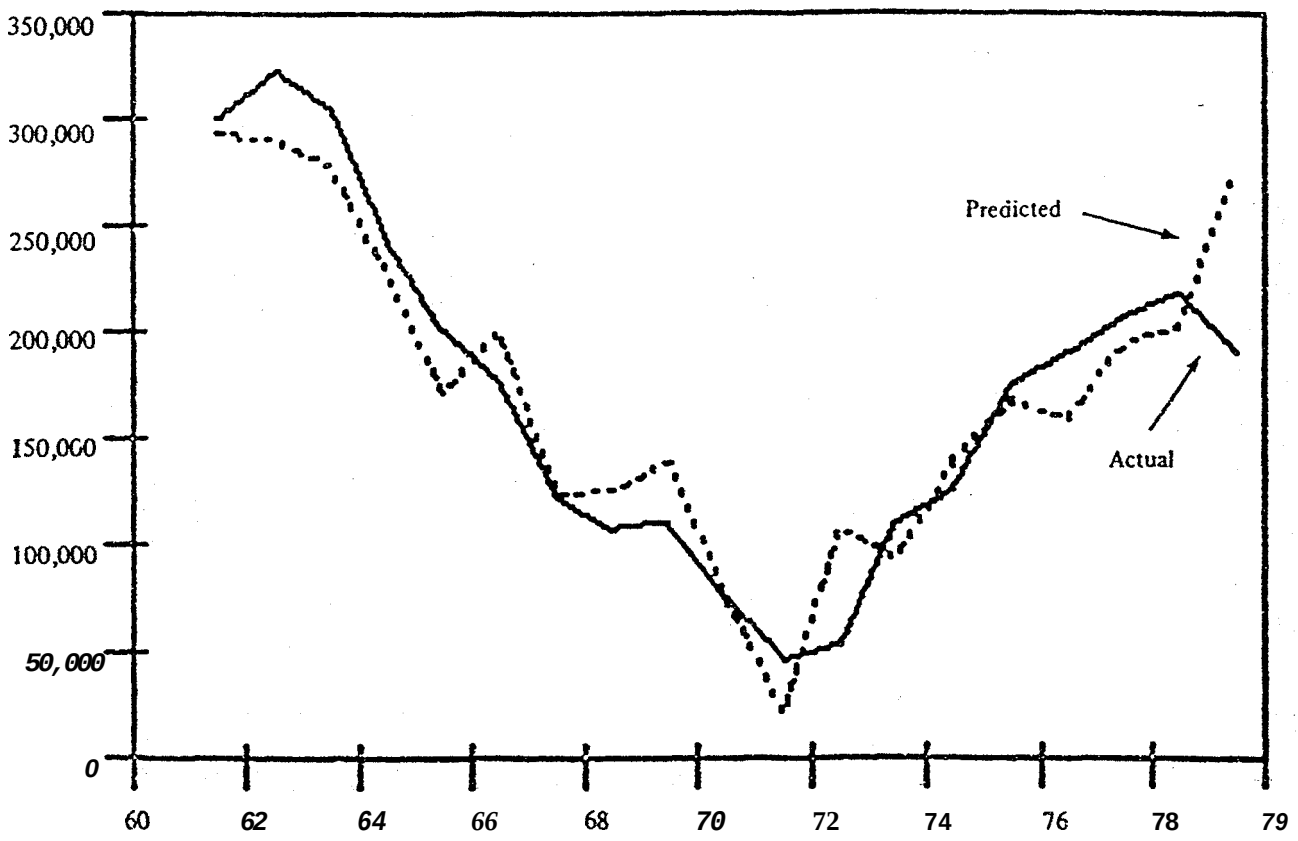
This empirical relationship supports a prediction that, when California and national unemployment rates are the same, approximately 300,000 people will again move to California annually. We can also predict that for every percentage point the California unemployment rate exceeds the U.S. rate, 100,000 fewer people tend to come to California each year. Thus it would take a California unemployment rate three percentage points higher than the national figure to eliminate inmigration.

But as Figure 2 shows, the relationship broke down in 1979. Instead of the predicted increase in inmigration, there was an actual decline. Job availability may have become less of a factor in determining population growth, being replaced by the rising prices of houses in California's major urban areas relative to house prices in the nation, as a key factor that caused the reduction.

If employment growth rates of the 1972-1979 period persisted, and the dynamic described above did not break down, California's population would reach 52 million by the year 2000. This suggests over 12 million people in Los Angeles County, and 7 million people in Orange County—giving Orange County the same population as Los Angeles County today—and Napa Valley's vineyards would be shared with nearly one million people (see Table 1).

Obviously, however, California population as large as this estimate would exert tremendous pressure to increase housing prices, and a rise would in turn slow down employment growth, in turn slowing population growth. In short, population projections cannot be bawd on a continuation of the rapid employment growth observed in the 1970s. The demand pressures that force up housing prices are likely to reduce California's future employment growth rates.

Predicted vs. **Actual** Net in-Migration *as* a Function of the California Unemployment Eate Minus the U.S. Unemployment Rate 1961-1979*



*The regression equation is: Net In-Migration = 313,982 - 103.026 (California Unemployment Rate - US. Unemployment Rare).
Standard Errors in parentheses: (15,790) (10.140)

The Emergence of Supply Restrictions

While employment was increasing rapidly in the 1970s, a host of physical and legal restrictions on new housing supply were developing. As the most readily available building sites are used up, the supply of new urban building sites requires more extensive capital investments to make them buildable, i.e., comprises land that is not flat. One has only to compare the San Fernando and Santa Clara valleys of the 1940s and today to dramatize the consumption of flnt land, much less of which is now available for construction sites.

In addition, two major categories of legal restrictions on development have had significant impacts: environmental constraints, and efforts to limit growth.[2] Environmental constraints associated with identifiable costs include the creation or strengthening of the Air Resources Board, Water Resources Control Board, Energy Resources Conservation and Development Commission, and the Coastal Commission. In addition, in t970 the California Environmental Quality Act mandated the preparation of environmental impact reports for substantial building projects.

Other more direct attempts to restrict growth try to maintain local amenity values, and take such forms as large-lot zoning or limitations on permits issued for housing units. The prevailing trend in zoning actions has been to reduce the amount of land zoned for high-density housing, as land has been reclassified or "down zoned" in many areas. More explicit slow-growth policies have been adopted in such cities as Petaluma, Davis, Thousand Oaks and Riverside. These restrictions have been especially harsh on multiple-unit construction.

Perhaps unintentionally, Proposition 13 appears to have accelerated the trend toward "fiscal zoning," which occurs when a community allows only those developments that pay their own way, i.e., when projected additional tax revenues produced equal or exceed estimated public spending necessary to service a development.[3]

Table 1

Implied Year 2000 Population if Employment Growth Persists at the 1972-1979 Rate

SMSA	1979 Population (in thousands)	2000 Projected population (in thousands)	Percent increase
California	22,694	52,122	130
Anaheim-Santa Ana-Garden Grove	1,874	7,494	300
Bakersfield	375	956	155
Fresno	485	1,180	143
Los Angeles-Long Beach	7,128	12,295	72
Modesto	251	651	159
Oxnard-Simi-Ventura	500	1,415	183
Riverside-San Bernardino-Ontario	1,445	3,435	138
Sacraniento	980	2,447	150
Salinas-Seaside-Monterey	281	537	91
San Diego	1,800	5,562	209
San Francisco-Oakland	3,194	5559	74
San Jose	1,253	3,953	215
Santa Barbara-Santa Maria-Lompoc	295	695	136
Santa Cruz	176	507	188
Santa Rosa	280	1.053	276
Stockton	320	613	92
Vallejo-Fairfield-Napa	312	901	189

Source: See end-notc 1.

Who Benefits? **Who** Loses?

Who has benefited and who **has** lost **as** a result of such land-use controls? If participation in heated public debate were a valid guide to **who** wins and loses, then surely the local California land developers would appear **to** have lost. This may **not** be the *case,* however, although the building industry has publicly denounced both statewide and local land-use controls. While builders clearly do not wish their current land holdings to be restricted in usage, this does not mean that they will not, given time and new opportunities, benefit on balance **from** land-use restrictions. Thus, for example, the aggregate value *of* land could increase as a result of supply restrictions.

California home builders experienced record profits after many of the land-use restrictions were imposed: (In 1980 the industry may have been depressed **by** severe financial strains stemming from U.S. inflation, but **this** situation is clearly not caused by local California land-use restrictions.) Restrictions on land supply do not stop the demand for housing, but instead increase the return to entrepreneurs **who** can maneuver building permits through the processes and bring new houses onto the market.

A very general, basic economic principle *is* at **work.** A mobile factor of production cannot readily be deprived of competitive returns. if restrictions on development in California should take away the profits of builders, they would tend to leave California. Indeed, by making building permits available only to the most adroit. persistent, and knowledgeable builders, governmental regulations may have enhanced the **profits** of local entrepreneurs, at the expense of the nationwide construction firms that *can* **no** longer compete **as** readily **as** they did before more extensive land-**use** restrictions were imposed. Tighter land-use restrictions mean that nationwide firms have to invest more **time** and money *to* learn how **to** process permits successfully. If **thii** is true, negative consequences of land-use restrictions probably do not **fall** on local California builders **so much as** on others.

A similar argument holds for landowners. In **any** given *case* of a proposed local restriction, the **owners** of *the* land will almost certainly scream loudly in protest—for good reason. Actions limiting **the** use of their individual parcels of land will not alter California's general land housing prices, while the individual landowner stands to lose in the decision at hand. But no such presumption holds when *all* landowners in California are "threatened" with more extensive land-use restrictions. In fact they may collectively benefit from land-use restrictions in general, in **the** form of higher prevailing land prices.

As will be discussed below, since the early 1970s home ownership in California **has** shown **an** extraordinary rate of return, especially for those who enjoyed small down payments and higher mortgages. Home prices increased rapidly (see Table **2),** whereas the mortgage liability for **a** given homeowner remained fixed. **Thus those** who now own homes do not appear to have suffered from these restrictions.

Table 2

California and U.S. Home Price Increases, 1971-1979
(Percent change)

Year	Southern California	San Francisco Bay Ares	Sacramento	US.
1971	3.8	5.2	3.3	7.8
1972	4.6	4.7	6.7	7.6
1973	6.3	6.8	7.1	8.5
1974	9.5	11.4	9.2	10.7
1975	15.4	13.5	11.2	10.1
1976	17.8	14.8	14.3	8.0
1977	26.7	23.7	15.4	12.3
1978	27.9	21.9	21.8	13.9
1979	20.8	15.9	21.6	14.1

Sources: Red Estate Research Councils cf Southern and Northern California and National Association of Realtors.

Others who may have benefited include those who place a relatively high value on preserving the environment, improving air and water quality, or reducing crowding and congestion.

Who loses? While no defmitive answer can be given, it seems plausible that nonlandowners and nonhomeowners have suffered losses, unless they place a higher value on the environmental benefits they enjoy, than on the increased housing costs they confront. Residents of other states who would prefer to work and live in California, but who cannot afford the high housing costs, may fall into this class.

Obviously, we cannot prove with certainty that landowners and builders have benefited from the land-use restrictions they have opposed so vigorously. But it would be a serious mistake to ignore this possibility.

Housing Prices and Economic Growth

California's rapid employment growth in the 1970s, and the emergence of supply restrictions on buildable sites, combined to intensify the home price explosion of the late 1970s. California's price increases clearly ran ahead of the rest of the United States. Table 2 represents home price data for Southern California, the San Francisco Bay Area, Sacramento and the US. (The prices reported for California are estimates for an unchanging sample of houses. This eliminates problems caused by changes in the mix of houses sold. The US. prices are based on actual transactions and are subject to changes in the types of houses sold.)

AS noted eadier, relative increases in home prices can slow employment growth. Anecdotal and empirical evidence–i.e., the decline in in-migration in 1979–supports this hypothesis.[5] Corporate and governmental recruiters tell us that the price of housing is the single greatest obstacle to recruiting out-of-state personnel for California.[6] High home prices :end to keep new people from moving to California, and they tend to motivate current residents to leave, since equity values in modest California houses will buy much larger houses in other states.

A More Realistic Set of Projections

The hypothesis—that California's comparatively high home prices act as a constraint on growth—leads to our second set of projections. The model employed recognizes the influence of population growth on home prices, as well as that of home prices on employment growth. Thus when employment growth tends to increase in-migration, higher population in turn puts pressure on home prices, while high home prices tend to limit employment growth. In short, population, employment, and home prices are interdependent and interrelated.

For each SMSA, employment growth in export-oriented industries (base employment), i.e., manufacturing, agriculture, mining and federal government employment, is related to the ratio of home prices to per capita annual income. The higher the home prices are in relation to per capita income, the slower the growth in base employment. Slower base employment leads to slower total employment growth, which in turn implies slower population growth. A higher ratio of home prices to income will therefore tend to limit population growth. (Total employment *can* still grow if labor force participation rates increase.)

In the model, this relationship is calibrated so that population growth stops completely when the home price/income ratio for a given area reaches 12, i.e., the home price is 12 times the per capita income. A home price/income .ratio of 12 means that housing costs comprise 45 percent of average household income. (The specific variables translating home prices and per capita income to household budget share are shown in Table 3.)

Several different home price/income ratios were analyzed before 12 was chosen as the most plausible value, bearing in mind related population projections. A value as high 2s 20 would lead to a population projection for

Table 3

Salient Points in Considering Impact of a "12 x Per Capita Income" Constraint for Housing Costs in California

• Per capita annual income (1979)	$9,992
• Average number of persons in household	2.64
• Average annual household income ($9,992 x 2.64)	$26,378
• House price at 12 times per capita income ($9,992 x 12)	$119,900
• Annual payments on such a house equivalent to	$11,898*
• Payments as percent of average annual household income ($11,898 ÷ $26,378)	45%
• Payment level as acceptable percent of average annual household income	30%
• Average household annual income required for the annual payments ($11,898) to amount to 30 percent of income	$39,660

*Based on: 30-year, 10 percent mortgage of $95,000; property tax payments of 12 percent of market value; and insurance of .3 percent of market value.

Note that the 10 percent mortgage rate reflects a long-run estimate of mortgage interest rates rather than current rates.

California of 35.7 million persons in the year 2000, and the distribution of that population across SMSA's seemed implausibly high in some areas. The chosen value of 12 leads to a population projection of 303 million, which is more consistent with other current population projections.

Moreover home prices as high as 20 times average household annual income would mean that far more than 45 percent of average household annual income would be spent on housing, and such a high budget share also seems implausible. Further, employment growth in the major coastal urban areas already appears to be somewhat constrained by home prices, even though the home price/income ratios are now closer to 10. (In a few years we presumably will have more experience with extraordinarily high home price/income ratios, and this empirical background may permit more rigorous econometric estimates of the appropriate value.)

In areas where the ratio of home prices to per capita income is as low as 5 or 7, and where building site availability permits substantial population increases without inordinate pressures on home prices, employment can continue to grow at roughly the same rates as in recent years. The Riverside-San Bernardino SMSA is an example. In 1972 house prices were 5.7 times per capita income, and by 1979 the home price/income ratio was still only 7.4. Not surprisingly, from 1972 to 1979 population increased by 22.6 percent and payroll employment increased by 36.4 percent.

On the other hand, in areas where home prices are as high as 10 times per capita anaual income, and where home prices are also quite sensitive to slight increases in population (e.g., Loo Angeles), employment growth is likely to slow down considerably as it becomes more difficult to achieve higher labor force participation rates. In Los Angeles the home price/income ratio was 6.8 in 1972, and had reached 10.7 by 1979. During that time, population increased by only 2.1 percent, whereas payroll employment, including commuters, grew by 23.8 percent.

In our model, each SMSA is treated independently of the other urban areas in California. Furthermore, as noted, home prices in some areas appear to be much more sensitive to population pressures than others. Thus home prices in Los Angeles appear significantly more sensitive to demographic pressures than those in Ventura County or the Riverside-San Bernardino SMSA, in part, no doubt, because Los Angeles has much less buildable open space near its urban core than the other two SMSA's. Because of differences in sensitivity, using the same home price/income ratio does not mean that all SMSA's will grow at the same rates between now and the year 2000. Table 4 shows the projections using the home price/income ratio of 12.

(It is important to note that relative home prices are the only constraint on population and employment explicitly provided in the modal. Other factors—e.g., the availability of water and energy, or an increase in air pollution—presumably could act as constraints long before the house price constraint took effect. But the possible impacts of those other constraints is the subject of another research effort, and is not examined here.)

Projections Under Home Rice Restraints

We project the total population of California to be 30.3 million persons by the year 2000, using the home price constraint. (Table 4 shows the population estimates using that constraint, contrasted with Table 1, which shows population projections without any housing cost constraint.) If employment is constrained by housing costs, there is likely to be a slowdown in employment growth in the urbanized coastal areas of California. California's new growth centers are therefore likely to be inland (e.g., Fresno, Bakersfield) rather than on the coast. Table 5 presents the recent rates of employment growth for all 17 of California's SMSA's, as well as estimates of employment

Table 4

***Estimated* Year 2000 Population if Employment Growth is Constrained by Housing Costs**

SMSA	1979 Population (in thousands)	2000 Estimated population (in thousands)	Percent change
California	22,694	30,292	33
Anaheim-Santa Ana-Garden Grove	1,874	2,986	59
Bakersfietd	375	733	95
Fresno	485	1,061	119
Los Angeles-Long Beach	7,126	7,266	2
Modesto	251	538	114
Oxnard-Simi Valley-Ventura	500	679	36
Riverside-San Bernardino-Ontario	1,445	2,875	99
Sacramento	980	2,047	109
Salinas-Seaside-Monterey	281	354	26
San Diego	1,800	2,093	16
San Francisco-Oakland	3,194	3,325	4
San Jose	1,253	2,180	74
Santa Barbara-Santa Maria-Lompoc	295	396	34
Santa Cruz	176	219	24
Santa Rosa	280	427	53
Stockton	320	568	78
Vallejo-Fairfield-Napa	312	460	47

Sources: See end-note 1.

Table 5

Percentages of Employment Growth 1972-1979 and 1995-2000 Estimated

SMSA	1972-1979 Growth rate	1995-2000 Estimated growth rate
California	3.7	1.6
Anaheim-Santa Ana-Garden Grove	7.8	3.2
Bakersfield	4.1	4.6
Fresno	4.5	4.9
Los Angeles-Long Beach	2.2	0.5
Modesto	4.6	4.7
Oxnard-Simi Valley-Ventura	4.6	3.1
Riverside-San Bernardino-Ontario	3.9	4.1
Sacramento	4.3	4.7
Salinas-Seaside-Montercy	3.3	2.5
San Diego	4.7	1.7
San Francisco-Oakland	3.0	0.4
San Jose	5.1	3.2
Santa Barbara-Santa Maria-Lompoc	4.1	2.6
Santa Cruz	5.3	1.6
Santa Rosa	5.6	1.9
Stockton	3.0	3.7
Vallejo-Fairfield-Napa	4.2	4.5

Sources: See end-note 1.

growth for the period 1995-2000. The inland areas showing the greatest employment growth in the 1995-2000 period are also those where easily developed land, i.e., relatively flat land. is available and housing prices are lower. The areas of high housing cost are, of course, the slowest growing.

Major implications

Major implications can be drawn from this analysis of the prospects and ccnsequences of future growth in California. First, almost inevitably California's recent rapid employment growth will slow significantly. also slowing economic growth. This development is of considerable significance to public and private planners alike. Second. if the state attempts to achieve employment growth that is greater than our constrained projections, state and local governments will have to encourage the production of housing units by relaxing restrictions. This would mean undoing many of the zoning restrictions enacted in the 1970s and increasing the zoning capacity of neighborhoods already built up. Such a change would represent a major policy reversal, and go to the heart of the issue of who has the right to say "no" to new housing development. It would in all likelihood mean higher density housing—e.g., townhouses, condominiums, apartments, and zero-lot line houses—closer to employment centers. It would also mean a reduction in local autonomy over land-use decisions.

Although the model suggests that California's inland areas will grow faster than other areas during the next two decades, it is of course uncertain whether the inland areas will in fact accommodate growth by supplying and financing the needed infrastructure of facilities and services necessary to urbanization. In addition to imposing infrastructure costs, such growth would also conflict with the goal of preserving agricultural land. Failure to supply the infrastructure, or to achieve some reconciliation between growth and agricultural land protection policies, will tend to slow the growth of inland areas.

The model also raises a host of other issues, including the linkage between rent control and growth controls. The emergence of supply restrictions helped to increase home prices. That condition plus the in-migration generated by a booming economy led to higher rents, and ultimately to political pressure for rent control. To increase employment further without expanding the housing supply would exacerbate the problem. In-migration has already helped price existing residents out of their apartments. Rent control can in fact be viewed as a form of growth control, because it prevents new residents from bidding housing away from existing residents.

Also related to rent control is the overall impact of high relative house prices on the nonhomeowning population. The model implies that population increases would push relative home prices higher, thus making it even more difficult for nonhomeowners to enter the housing market. Consequently unless there is either a significant slowdown in employment growth, or a substantial increase in housing supply, the home ownership opportunities are likely to be foreclosed to a large part of the population for the foreseeable future. This could exacerbate the existing tension between renters and real estate owners.

Another development involves government finance One of the conditions favoring the creation of our huge state surplus was California's ability to increase employment faster than population. While this continued. revenues could increase faster than costs, revenues being more a function of employment, and costs more a function of population. But if population growth catches up to employment growth, state and local government budgets could be severely affected by costs that rise faster than revenues.

Concluding Cornment

California is undergoing major changes. Familiar past trends are unlikely to continue, and a simple extrapolation of recent employment and population trends does not provide a reasonable or plausible guide to the future. Although land-use restrictions have probably limited the amount of congestion and crowding in California, other considerations are now looming in importance. Thus the trade-off between faster employment growth and a better environment will intensify once it appears unlikely that labor force participation rates can grow substantially.

The fault lines of the conflict can be identified, even though it is impossible to predict where and when the political quakes will occur. We expect political tensions to grow over the issues of rent control, restrictive zoning, agricultural land protection, the funding of public infrastructure and services, higher densities in existing urban neighborhoods, the overburdening of transportation facilities, and the allocation of urban space among different socioeconomic groups. The conclusions presented aie intended to assist in the policy evaluation of these issues. We do not here attempt value judgments on how these issues ought to be resolved. Voters and their elected representatives will be deciding these matters. In the process, coalitions that have supported increasingly restrictive land-use policies are likely to fragment, and conflict among voting groups is likely to intensify in the coming decades.

In essence, until now California has been able to have its cake and eat it, too. We have restricted land use significantly, while also enjoying very rapid employment growth. This combination is almost certain to end. Accordingly in the near future we must either actively facilitate rapid expansion of the housing supply, or accept a dramatically slowed rate of employment growth.

NOTES

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For the find report on which thin paper is based, the writers have provided the following acknowledgment: Wc are grateful for the assistance of Peter Jaquette, Research Associate at the UCLA Business Forecasting Project. for his assistance in developing the economic models discussed herein and for his important insights in the economic issues involved. We are grateful to Martin Helmke, Art Packenham, lames Patterson, Isabel Hambright and John Cummins for their helpful comments on an earlier draft. The study benefited from the substantive and editorial suggestions of Ms. Ruth Galanter.

1. All employment and population data were retrieved from the Security Pacific National Bank computerized data bank. The original source documents are from the Population Research Unit of the California Department of Finance and the California Employment Development Department.

2. See, for example. Fred E. Case, "Housing Prices and Environmental Impact Reports (EIR)," *California* Heal *Estate Indicators*, Graduate School of Management, UCLA (Spring 1980). pp. 2 and 4; and Robert Kneisel, "The Impact of the California Coastal Zone Conservation Commission on the Local Housing Market: A Study of the South Coaw Regional Commission." unpublished Ph.D. dissertation. University of California, Riverside (December 1979). Both studies reported higher house prices as a result of regulation.

3. See. for example, Jeffrey I. Chapman and John J. Kirlin, "Land Use Consequences of Proposition 13," pp. 95-124, and David Shulman, "Proposition 13 and the Spatial Allocation of Economic Activities." pp. 125-137, in *Southern California Law Review* 53: 1 (November 1979).

4. See. for example. Shapell Industries. Annual Report. 1978. Shapell is California's largest homebuilder with 3 sales volume of 5243 million in 1978 when it delivered 2.026 houses. Its operating profit increased from $21.7 million in 1976 to $62.2 million in 1978. During that same period operating income as a percentage of sales increased from 16.5 percent to 25.6 percent.

5. See, for example, Scott LeFaver, "Will Success Spoil Silicon Valley?" in *Planning* 46 (4). 22-25 (April 1980).

6. See, for example, John Merwin, "When Cities Get Too Popular," *Forbes* 126 (6): 72-76 (September 15, 1980); this article discusses the adverse Impact of high housing costs on the California economy.

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HOUSING ALLOCATION AND METROPOLITAN DEVELOPMENT

BY

JOHN M. QUIGLEY

GRADUATE SCHOOL OF BUSINESS ADMINISTRATION

Reduced local government support in the wake of Proposition 13 (limiting property tax rates in California) and the federal cutbacks in grants for local services have made it difficult to finance expansion of the infrastructure and public services necessary for housing development. Because communities can not increase property taxes enough to pay for local services needed by new residents (schools, sewers, etc.), fees are imposed on new housing development, increasing housing prices. Because local revenues are roughly proportional to housing values and the demands for services are roughly proportional to the number of households, local governments have strong incentives to adopt zoning regulations requiring large amounts of housing consumption. These regulations, so-called "fiscal zoning," are intended to [illegible]re new residents to consume (and to pay p[illegible] taxes on) more real estate than they [illegible]uld otherwise choose.

As a result, much of the new development excludes housing that could serve lower income persons. New rental construction approved at the local level tends to be small units that cater to older couples (who use relatively few local services); new housing for young families (who use many public services, particularly schools) is less widely available. The problems created by Proposition 13 are unresolved; in consequence, local governments continue to resist rapid development of housing.

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locations. The most frequently mentioned reason for site selection was the proximity to the residences of key employees and managers. Two fifths of firms mentioned this factor, and another 15 percent were concerned with proximity to the workforce. About 20 percent of larger firms (with more than fifty employees) were concerned with proximity to the homes of key employees, while 40 percent were concerned with the location of the workforce, Transportation access and the cost of space concerned one-fourth of all firms, and were of somewhat greater importance to larger firms.

Further, interviews with tenants in newly constructed space indicate that firms seek greater labor force availability, either through reduced commutes or by capturing secondary earners, and they seek a more highly educated local work force. Significantly, interviews with many of the largest developers and builders of the facilities suggest that they had chosen these building sites for similar reasons in anticipation of the demand.

b. Competition Between the Bay Area and Other Regions: Housing Affordability

The San Francisco Bay Area is well known for its natural resources and mild weather, its relatively low levels of pollution and congestion, and its striking architecture, making it one of the most desirable locations in the U.S. in which to work and live. Per capita income in the region is

sixty percent above the national average, and it has attracted the highest average educational level of any US local labor market.

Not surprisingly, housing prices are high. By August 1988, the median price of owner occupied housing in the region was $216,000, and prices had increased by 71 percent in six years.[13] In six years median housing prices increased from 1.8 times the national median to almost 2.5 times the median for the US as a whole. At current prices, only about one household in eight already living in the area could afford to purchase the median priced house, given widely accepted rules of thumb. In large part, of course, high housing prices are to be expected, given the desirability of the region, There are, however, strong indications that the regional price level. for shelter has begun to act as a deterrent in the competition for new business activity.[14]

The question is whether governmental policies have acted to increase housing prices above competitive levels. Here the answer is almost certainly yes.

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13 These and other background statistics are discussed in Hird, et *al*, *op cit*, and Kenneth T. Rosen and Susan Jordan, "The Ban Francisco Real Estate Market," Berkeley, CA: Center for Real Estate and Urban Economics, 1988.

14 For a recent example from the popular press, see Fortune Magazine, Oct 2, 1989.

Reduced local government support in the wake of Proposition 13 (limiting property tax rates in California) and the federal cutbacks in grants for local services have made it difficult to finance expansion of the infrastructure and public services necessary for housing development. Because communities can not increase property taxes enough to pay for local services needed by new residents (schools, sewers, etc.), fees are imposed on new housing development, increasing housing prices. Because local revenues are roughly proportional to housing values and the demands for services are roughly proportional to the number of households, local governments have strong incentives to adopt zoning regulations requiring large amounts of housing consumption. These regulations, so-called "fiscal zoning," are inten to require new residents to consume (and to pay property taxes on) more real estate than they would o choose.

As a result, much of the new development excludes housing that could serve lower income persons. New rental construction approved at the local level tends to be small units that cater to older couples (who use relatively few local services); new housing for young families (who use many public services, particularly schools) is less widely available. The problems created by Proposition 13 are unresolved; in consequence, local governments continue to resist rapid development of housing.

In addition to these direct policy driven causes of high housing prices, there are a number of indirect market effects that arise from policy and which influence the local market. Important among these are bottlenecks and monopoly power.[15] Bottlenecks occur when housing demand exceeds supply and either prices do not rise sufficiently to clear the market (e.g., the rent controls adopted in nine Bay Area cities) or local land-use controls do not permit expanding supply. The result is the low vacancy rates that exist in many Bay Area communities.

Monopoly power can be exercised by developers who benefit from restrictive land use regulation, which limits the amount of land available for development and makes controlling local land markets easier. Complex administrative procedures, lengthy application periods, and other measures that typify Bay Area local development policies can induce monopolistic control of local land markets. Credible studies of development have found that the excess profits were largely attributable to constrained housing supply and the lack of competition.[16] In other suburban areas, the lack of developable land and high development fees have given dominant control of the housing market to a few large developers.

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15 See David Dowall, The Suburban Squeeze, Berkeley CA: University of California Press, 1984.

16 See David Dowell, *op cit.*

These indirect effects may exert a powerful influence over local land use and development. Any policies hoping to improve the present housing conditions in the Bay Area must recognize these important, though subtle consequences of such policies. Environmentalism and local land regulations preventing rapid growth are supported by many Bay Area residents, especially since limitations on property tax rates have made it more difficult for existing residents to "profit" from additional housing development. Attempts to change this pattern are not likely to be initiated by local governments or their constituents.

The ultimate source of *the* problem is the balkanized pattern of building permit and land use regulation.

THE IMPACT OF SUBURBAN GROWTH RESTRICTIONS ON U.S. HOUSING PRICE INFLATION, 1975-1978[1]

David Segal and *Philip Srinivasan*
Oxford University and Harvard University

The paper estimates a simultaneous equations model of housing price inflation 1975-1978 for a cross-section of 51 metropolitan areas. A two-stage least squares procedure is used to estimate the demand-side and supply-side determinants of price changes. One of the major sources of inflation is shown to be a variable reporting suburban growth restrictions—the fraction of potentially developed land just beyond the margin of urban settlement that is sequestered from growth. Nearly two-thirds of the SMSAs in our sample had growth restrictions, with an average of 12% of available suburban land set off-limits to growth. Some cities barred growth from as much as 30 to 40% of the nearby surrounding land. Such controls were found to have contributed significantly to inflation. The growth-controlled cities experienced an inflation rate that was about 17% higher than those that did not restrict, ceteris paribus—12.5% instead of 10.8% annually, 1975-1978.

As the purchase price of new and existing homes began to dip in early 1980, housing prices nationwide had just completed a period of their most dramatic increase since the start of record keeping. During the period 1973-1979, home prices increased at an average annual rate just short of 10%; toward the end of the period, home inflation accelerated, reaching 13.4% in the last year.

Such figures mask an enormous amount of geographic variation. In Denver and Phoenix, prices rose at an annual rate of 20 to 25% between 1977 and the spring of 1978; price increases were only slightly lower in Chicago, Dallas, and Houston. Some Phoenix builders reported selling out homes even before streets and curbs had been laid in. Boom conditions in some California cities had no parallel (Grebler and Mittelbach, 1979). At the other extreme, home price increases in Jacksonville and Richmond averaged 5.3% annually, and in Milwaukee a mere 4.2%.

A literature is emerging on the forces behind the housing price inflation of the mid- to late-1970s, on why price increases in this sector have tended to exceed increases in the general price level by 2 percentage points or more in all but two of the years since 1974. Frieden, Solomon and Birch (1977), as well as Hendershott and Hu (1979), have stressed the role of inflationary expectations in inducing a higher demand for housing than would otherwise have been the case. Schwab (1979) believed capital market imperfections such as the institutional prevalence of the level-payment mortgage forced many households to choose differently among three goods, present consumption, future consumption, and housing, in favor of the last.

Remarkably little has appeared on the causes of variation in housing inflation rates across cities. We address this question by means of a straightforward comparative statics model, reporting the partial effects of demand and supply forces on housing price outcomes at two points in time. The model is tested using observations on 51 metropolitan areas for 1975-1978.

Urban Geography, 1985, 6, 1, pp. 14-26.

We find that demand-side factors—variations in the rates of income, population and mortgage rate changes within our sample—had a significant influence in housing price increases, No less important, however, is the role played by suburban growth restrictions. They explain as much as 40% of the variation in urban housing price inflation unexplained by demand-side factors. As a class, growth-restricted cities entered the mid-1970s with a hatf percentage point higher inflation rate tha.. unrestricted cities, ceteris paribus. Moreover, every 10% of a city's potential suburban land that was set off-limits to growth during 1975-1978 contributed an additional 1.0 percentage point annually to its inflation rate in home prices. Taken together, these considerations meant that the average growth-restricted city, with more than 12% of its suburban land off-limits to growth, experienced an inflation rate in housing prices nearly 2 percentage points above an average unrestricted city.

The impact of growth restrictions, however, was not linear: Larger fractions of suburban land withdrawn from growth caused increasingly higher inflation rates. Cities reporting more than 20% of outlying land growth restricted added more than 6% to their annual housing price inflation rates, ceteris paribus.

In the balance of the paper, we describe our underlying model, the data, and the empirical results.

THE MODEL

An appropriate means for analyzing the effects on housing prices of unanticipated exogenous demand shocks is the stock-adjustment model. Once we know the nature of the adjustment process and the magnitude of the adjustment parameter, it is possible to identify short-run equilibrium prices for all points in time after a shock. If, on the other hand, there are no demand shifts that are not anticipated, then a statics model is quite appropriate for examining equilibria at different points in time.

We do allow for the possibility of unanticipated demand shifts within the context of a comparative statics model by assuming that exogenous changes in demand cause equilibrium prices to move smoothly, i.e., we assume that the stream of exogenous demand increases is such as to cause equilibrium prices to grow smoothly. Mathematically this requires that when we solve lagged-adjustment equations for short-run equilibrium housing prices at t and t + 1, the actual values are ahead of the target values by the same percentage in both time periods.

The above assumptions allow us to present a dynamics process as a comparative statics result. This is illustrated in Figure 1, in log-log, price-quantity space. Because slopes of dernand and supply functions in such a diagram are elasticities, a demand shift between times t and t + 1 that leaves demand elasticity unchanged will cause D_{t+1} to be parallel to D_t.

There are two issues of particular interest in this paper. One is whether the supply function for growth-restricted cities, S or S', has the same *y-axis intercept* as that for cities that do not restrict suburban growth, $\tilde{S}$. A second is whether the supply elasticities of housing are the same for both kinds of cities. This is a question of whether the dopes of S or S' and $\tilde{S}$ are the same. Were this the case, cities with growth restrictions would have the same inflation rate as those without. This is because c is the same vertical distance above d as is b above a.[2]

On the other hand, if supply elasticities differ between the cases of growth restric-

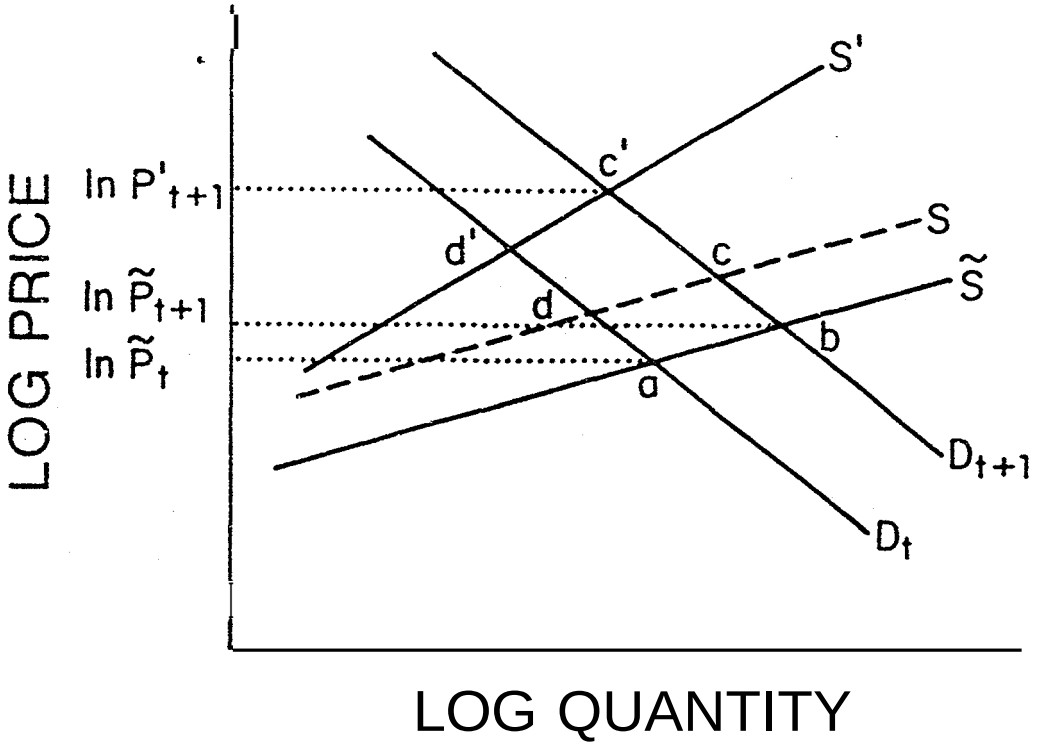

Fig. 1. Housing market inflation: A comparison of cities with and without growth restrictions.

tions versus no-growth restrictions (S' versus $\tilde{S}$), the price inflation rates will alsodiffer. The mechanism causing this to happen is an interaction effect between the housing supply function and a variable representing growth restrictions: The fact of interaction causes the slopes of the supply function (the elasticity in Fig. 1) to be different between growth-restricted and -unrestricted cities. We shall be interested to test whether and how growth restrictions affect housing price inflation, i.e., whether the interaction effect is statistically important; for the present, we suggest as a working hypothesis that such effects do matter. Specifically we would expect restrictions to increase the rate of inflation, ceteris paribus—that they render $(c' - d') > (b - a)$. Also we shall be interested to see whether the two supply functions cross the y-axis at the same point On a priori grounds we might expect that the supply curve for growth-restricted cities would have a higher intercept, reflecting a higher initial price level for these cities.

Before proceeding with a discussion of the functional form of equations to be estimated, some comments are in order regarding a model structure that might justify the above hypotheses. Consider two cities of identical size and spatial structure except that one has growth restrictions while the other does not. Such restrictions might take the form of environmental ordinances withdrawing from development a portion of the annulus of open space just beyond currently outlying settlements. This is shown in the schematic diagram of Figure 2 where the land into which suburban settlement might ordinarily expand is shown as the outer ring or annulus, and the area that is sequestered from growth is represented by the shaded portion.

The impact of an increased demand for housing on existing patterns of density and

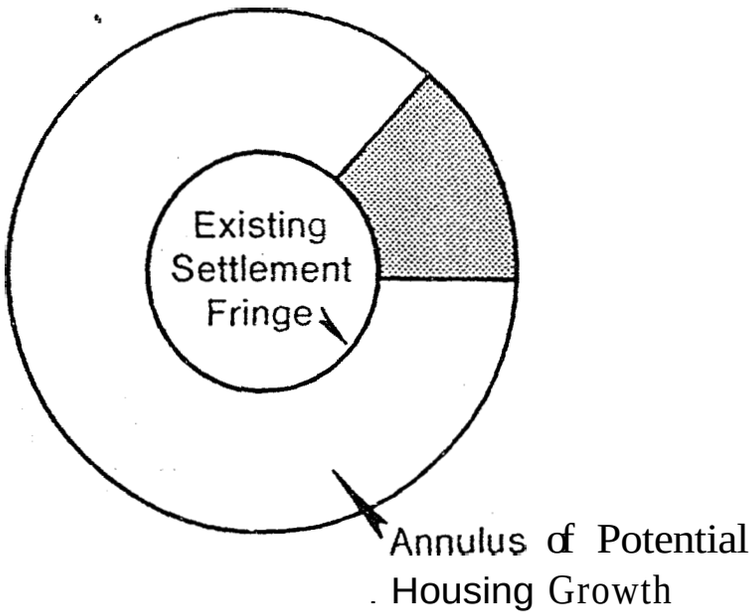

Fig. 2. Area of potential suburban land restricted from growth.

prices (and hence on mean density or price) is well known (see Muth, 1969; Mills, 1972). Growth restrictions of the sort described, by limiting growth at the margin of settlement, thus upset the trade-off between travel time and lor size. Households will pay higher prices for interior locations to avoid the extra commuting time of living be yond the growth-restricted area Accordingly, lot prices at all interior locations, as well as at locations in the unrestricted portion of the annulus and beyond what would be the new margin of settlement in the absence of growth restrictions, will be bid to positions above their no-growth-restriction equilibrium levels. Moreover, in terms of a dynamic model of the statics version of one presented here, housing prices in the growth-restricted area will be higher than in its unrestricted counterpart, both initially and at all future points in time. Assuming the substitution elasticity between land and nonland factors of production is less than infinite, growth restrictions will lead to an unambiguous increase in average density and housing prices.

What estimating procedure is suitable for testing the impact of suburban land-use restrictions? A model analogous to Figure 1 involves a pair of demand equations at two points in time and one or more supply equations, dependingupon whether growth-restricted and unrestricted cities have separate supply functions.

Consider the following two-equation model:

(1) *Demand equation:* $\ln P_t = a_0 - a_1 \ln Q_t + a_2 \ln Z_{1t}$

Supply equation: $\ln P_t = b_0 + b_1 \ln Q_t (1+cG_t) + b_2 \ln Z_{2t} + b_3 G_t$

where P_t is the average price of housing in a city at time t, Q_t is the size of the city's housing stock, Z_{1t} is a set of demand-side variables other than Q_t that vary across cities, Z_{2t} represents supply variables other than Q_t, and G_t reports the fraction of a

city's potential suburban land that is removed from growth—the shaded area in Figure 2 as a fraction of the area of the entire annulus.

Our goal is to study neither the level of housing prices across cities nor the difference in such levels at two points in time, but instead the percent change in prices. If the various demand and supply elasticities are unchanged over time, a reasonable assumption for the short run (and also a testable hypothesis), we c2n imagine a pair of difference equations, one demand and one supply, that take the difference of each equation of (1) at two points in time, t and t + 1:

$$(2) \qquad p = a_0 - a_1 q + a_2 z_1$$

$$p = b_0 + b_1 q(1+cG) + b_2 z_2 + b_3 G$$

where $p = (\ln P_{t+1} - \ln P_t)$; $q = (\ln Q_{t+1} - \ln Q_t)$; etc. The lower-case symbols of equation (2) represent percent changes in the variables represented by capital letters in equation (1) (see note 2). The object of the analysis, as mentioned earlier, is twofold: to learn whether the supply function for growth-restricted cities has a different elasticity from that for unrestricted cities ($c \stackrel{?}{=} 0$); and to learn whether the y-axis intercepts are the same for the supply functions for growth-restricted and unrestricted cities ($b_3 \stackrel{?}{=} 0$).

As we note in the next section, the scarcity of high quality time-series data on changes in the levels of suburban growth restrictions in different cities led us instead to consider a variable reporting the *average* percentage of developable suburban land put off-limits to growth *during the inflationary period* under study, G. in the transition from equation (1) to equation (2) this procedure clearly would cause the G in (1) to drop from the difference equation of (2) because it is a state variable equally present in both level equations. Above we argued that the presence of a variable representing growth restrictions affecting a pair of growing cities (a} that start with identical size and spatial structure and (b) that otherwise grow identically can be expected to increase housing prices in the restricted city at all periods of time subsequent to the restriction, above their equilibrium levels in the absence of the restriction. Accordingly we include G in only one of the levels equations of (1) so that it survives when the subtraction is performed.

Including G in equation (2) rather than $(\ln G_{t+1} - \ln G_t)$ means that testing to ascertain whether supply elasticities differ between growth restricted and unrestricted cities (slope of S' = slope of $\tilde{S}$ in Fig. 1) cannot be done by examining the coefficients of G alone, When G is entered independently of the other variables of equaiion (2), its coefficient would shift the location but not the slopes of the functions of Figure 1. When G appears in the supply equation of equation (2), its coefficient reports whether the y intercept of S' differs from that of $\tilde{S}$. In addition we must took at the signs and significance of the interaction between G and q, in an equation that includes q separately.

Estimating the parameters a, b and c of equation (2) in reduced form is not an attractive option. This is because one of the variables, G, remains imbedded in the parameters of the reduced form equation even after q, or p, is subtracted out

We instead rearranged the variables of the supply equation of equation (2) so as to linearize it, and we then used the two-stage least squares (2SLS) estimating procedure:

(2') $p = a_0 = a_1 q + a_2 z_1$

$$p = b_0 + b_1 q1+cG) + b_2 z_2 + b_3 G = b_0 + b_1 q + dx + b_2 z_2 + b_3 G$$

where $x = Gq$ and $d = b_1 c$. The coefficient c is estimated indirectly: $c = d/b_1$. Fieller bounds may then be computed for c.

The vector of exogenous demand variables, z_1, has three components in the empirical work below: percentage change in per capita urban income, y; percentage change in urban population, n ; and percentage change in mortgage interest rates, r. We hypothesize that $\frac{\partial p}{\partial y}\frac{\partial p}{\partial n} \geqslant 0$. if changes in y and n are fully foreseen by housing suppliers, the first-order partial derivatives will be close to zero. Otherwise they will be greater than zero, as supplier quasi-rents accrue. Whether such changes are fully foreseen can be learned empirically.

We can expect $\frac{\partial p}{\partial r}$ tobe negative. Because mortgage money is a good complementary with housing purchases, decreases in r will tend to shift the demand function to the right. Again, whether we move along a short or long run supply curve depends upon whether the decrease or increase in r was anticipated.

z_2, the set of exogenous supply variables, has but one component, construction costs, k. The hypothesis of $\frac{\partial p}{\partial k} < 0$ requires no elaboration.

THE DATA

The empirical analysis of the next section is performed on observations on a cross-section of 51 metropolitan areas for which data were available during 1975-1978. The areas are listed in Appendix A along with observations on the 19751978 home price increases and the growth restriction variable. The latter variable is the focal point of much attention in this paper and is discussed at length below. First we offer a brief description of the other variables and their sources.

Home Prices

Federal Home Loan Board data were used, reporting a weighted average of current doltar prices for new and existing single-family houses sold in each of the SMSAs in December 1975 (P_{75}) and in December 1978 (P_{78}). Only conventionally financed homes are included by the FHLBB. Data on prices in the 30 largest SMSAs are to be found in the monthly publication, *Terms on Conventional Home Mortgages* (Washington: FHLBB, 1974 through 1978). Observations on additional SMSAs are made available by the FHLBB for a small fee.

We employed three dernand-side and twc supply-side variables which are presented in sequence.

Income

Many housing market studies have concluded that permanent income is the best income measure as an argument of housing demand, Such data are not readily avail-

able for metropolitan areas and we used current per capita personal income as a surrogate. The data are drawn from the *Survey of* Current *Business.* We used average annual data, comparing 1975 personal income per capita (Y_{75}) with that for 1978 (Y_{78}).

Population

The number of households is the measure best suited to study the population component of housing demand, particularly households in the demographic categories most likely to occupy single-family dwelling units. These data cannot be obtained annually for metropolitan areas so we tried several proxies. The most successful was straight population taken from the Census Bureau's P-26 Series, for July 1975 (N_{75}) and the same month of 1978 (N_{78}). We also tried migration data from the same publication, as well as numbers from annual issues of the Rand McNally *Commercial Atlas.*

Mortgage Rates

Our final demand-side variable relates the price of a good complementary with housing, mortgage money. We used FHLBB data from the same source as the price data reporting contract mortgage rate of interest plus lender fees and charges in December 1975 (R_{75}) and December 1978 (R_{78}). Although 19 states have usury laws, the post-1975 recovery saw a mortgage climate sufficiently mild to allow interest rates to move unconstrained.[3]

On the supply side our primary variable is the Boeckh index of nonland construction costs, with Milwaukee, 1967 = 100 as the numeraire. The index captures unit labor and materials costs in single-family construction and allows for intercity cost comparisons over time. We used numbers for July 1975 (K_{75}) and July 1978 (K_{78}), published in *Boeckh Modifier of Construction Costs,* by the American Appraisal Company (Washington: 1975, 1978). We assume that the labor and material construction costs are horizontal with respect to the stock of housing in any particular city, implying a horizontal supply curve for these costs in that city.

Growth Restrictions

By far the largest part of our effort in data collection involved gathering numbers on the fraction of otherwise available suburban land during 1975-1978 that was put off-limits to development. The early part of the decade saw a major increase in the number of communities employing growth management techniques based on environmental or fuel allotment considerations. In some cases, development was stalled because of moratoria on water supply (particularly in the South or West) or on sewer connections. In other cases the unavailability of larger allotments of natural gas was a factor. (Only recently has the moratorium on natural gas tie-in been lifted from some of the areas surrounding Baltimore.) In several metropolitan areas there has been public acquisition of open-space land through fee simple acquisition or annexation. In still others, rationing devices such as building permit restrictions and zoning have been used to sequester some land from growth.

The data were gathered through interviews with the staffs of Regional Councils of

Governments, or of regional and local planning agencies, in each of the 51 areas. The purpose of the interviews was to ascertain, for a given metropolitan area, the extent of land-use controls within the jurisdiction of various agencies prevailing during the 1975-1978 period.

Data were collected both on the percentage of land in otherwise developable suburban land removed from growth in 1975 (+), in 1978 ((&), and on average throughout the period (G). As is shown in Appendix A values of this variable ranged from *0* (about a third of the areas) to 43.5 (Sacramento). The average percentage of land removed from growth in areas reporting growth restrictions was 12.7%; for a fifth of the areas, land sequestered from growth ran over 15% throughout 1975-1978.

For several specifications in the next section we use dummy variables for the percentage of land that is growth managed: 0-5% (Go), 5-10% (G_1), 10-15% (G_2), 15-20% (G_3), and above 20% (G_4).

Quantity of Housing Units

As one of the two variabies, along with price, endogenous to our model, the Q (or q) variable plays a central role. As noted above, eliminating the quantity variable in a reduced-form equation poses a linearity problem, so we left the variable in the analysis.

Unfortunately, annual data on the stock of housing units by metropolitan area are not available, so it was necessary to estimate them. The q variable has a *flow* term in its numerator, net additions to stock between 1975 and 1978, and a *stock* term in its denominator, the quantity of units in place in 1975. Data were more readily available for the numerator than the denominator; the latter had to be constructed from 1970 data and figures on population shifts in the interim.

The rather crude approach to estimating the denominator of q is mitigated by (a) the relatively higher quality of numerator data and (b) the relative insensitivity of estimates of q to errors in the denominator. The mean value of q in our sample was .071. Accordingly, a 10% measurement error in Q_{75} for a city which experienced a change in housing stock 1975-1978 close to the mean will result in a 0.7% error in the estimate of Q for that city.

In estimating Q_{75} we took 1970 Census figures for the total number of housing units in an area, augmented them by new construction figures (permit data coming from the Commerce Department), and decremented them by our estimates of withdrawals (equal to demolitions plus net change in vacancies) from the housing stock. Lacking good data for withdrawals, we used as a proxy for changes in vacancies 1970-1975 figures on net household formation (net natural increase plus net migration), drawn from the Current Population Survey. The numerator data, $Q_{78} - Q_{75}$, were largely drawn from the "Summary of Housing Characteristics" in the Annual Housing Survey.

Results

Table 1 presents the results of four models that were tested. The first two models suppress a separate constant term for the supply firnction for growth-restricted cities, forcing S' to intersect $\tilde{S}$ at the y-axis. The second pair of models allows for the inter-

TABLE 1.—TWO STAGE LEAST SQUARES REGRESSION RESULTS

Model Number:	1		2		3		4	
Variable	Demand Equation	Supply Equation	Demand Equation	Supply Equation	Demand Equation	Supply Equation	Demand Equation	Supply Equation
CONST	- .084*	- .027†	- .084*	- .074†	.016		.011	
q	-1.17†	.74†	-1.03†	1.98†	- .017	.717†	- .890*	295
y	1.68*		1.67*		1.58*		1.66*	
n	2.82†		254†		.536		2.27*	
r	-1.46*		-1.47*		-1.49*		-1.47*	
G						.005*		
x		.297*				.069*		
k		2.46**		252†		1.48**		1.44**
G_1								.009
G_2								.030
G_3								.091
G_4								.172
x_1				-14.6*				-3.57*
x_2				-22.2*				-3.31*
x_3				-18.3†				-3.72*
x_4				- 62				-1.28
standard error of dependent variable	.211	.211	.211	.211	.211	.211	.211	.211
standard error of regression	.198	.212	.196	.421	.210	.148	.196	.154

† Coefficient greater than standard error.

* Significant at 5% level.

** Significant at 1% level.

section to be other than at the y-axis (by including the growth management variable separately). Models 1 and 3 treat growth management as a continuous variable; models 2 and 4, in the form of a dummy variable, as described in the previous section.

The coefficients of the demand equations appear to shed some light on the question of anticipated versus unanticipated demand shifts. Income and mortgage rate changes have the right sign and are significantly different from zero in all models, suggesting the possibility that shifts in these variables were less thzn fully discounted in the market place. That is, when shifts are futly anticipated by the market, the new equilibrium positions tend to be only slightly above the old ones as demand shifts along a highly elastic long-run supply function. The inflationary impact of such shifts under these circumstances would be minimal and might not differ from zero.

While inflationary consequences of income and mortgage rate variation in our cross-sections sample are in evidence, suggesting less than full anticipation and some amount of supplier quasi rents, the impact of poputation shifts is more ambiguous. While the elasticity of the population variable, n, has the same order of magnitude in three of the four models, it is statistically significant in only the last. The coefficient has the right sign in all models. The sign and significance of the q variable follows much the same pattern as that of n.

It is Interesting to note that the pattern of demand elasticities is very much what one might expect on the basis of the published literature (e.g., De Leeuw, 1971). Price elasticity is about unity and income and interest efasticities about 1.5.

We found support for our assumption of no change in the demand elasticities between t and t + I (parallel shift of DD in Fig. 1). We did this by comparing (a) the sum of squared residuals for the separate equations for 1975 and 1978 of equation (1) in which the equations were partitioned by time period with (b) the sum of squared residuals for the pooled data set and, employing an F test, could not reject the hypothesis of a constant elasticity at standard levels of significance.[4]

On the supply side, construction costs, k, have the right sign and magnitude in all of the models and a high tevel of significance in all but one model. The housing supply variable, q, has the right sign in all models, but the desired level of significance in only one.

Jhe growth management variable, whether interacted with q (as in $x, x_1, \ldots, x_4$) or standing on its own to report y intercept information ($5, G_1, \ldots, G_4$), almost everywhere has the anticipated sign, magnitude and significance. Because of the statistical significance of G, we learn that models 3 and 4 are better specified than the first two and that when G is specified as a continuous variable the y-axis intercept of S' is .005 above that of $\tilde{S}$. This suggests that growth-restricted cities have half a percentage point "head start" on inflaticn over unrestricted cities, before the interaction or elasticity effect (S' versus S) is reckoned.

What is the "elasticity effect"? This, we recall, is the tstimate of c, reckoned as the coefficient of x divided by that of q in the supply equation. When growth management is viewed as a continuous variable—models 1 and 3—this computation yields 0.4 and 0.1, respectively. Becaux the former model forces the intercepts of S' and $\tilde{S}$ to be equal it makes c higher than would otherwise be the case. Model 3 has the greater credibility.

The estimate of c = 0.1 from this model implies that every 10% of potential suburban land sequestered from growth (as in Fig. 2) causes inflation to be one percent-

age point higher, ceteris paribus, or 1.5 percentage points higher when the force of the constant term is included. On average, growth-restricted cities are seen to have a 1.7 percentage point higher inflation rate than that of unrestricted cities when demand- and other supply-side factors are properly controlled for. On average, growth-controlled cities had an infiation rate In housing that was 3.0 percentage points higher than that for uncontrolled cities. Our estimation procedure, which brings this down to 1.7 points, ceteris paribus, suggests that the simultaneity problem, addressed by our technique, is not trivial.

Fieller bounds for c were estimated at the 95% confidence level and found to be ±.018. This suggests the possibility of a 20% error in our elasticity measure at that level of confidence,

Models 2 and 4 suggest that the impact of G may not be linear and that in percentage terms there may be a greater inflationary impact from growth restrictions at higher levels than a linear model would suggest. The percentage gaps in the coefficients of $x_1, \ldots, x_4$ increase more rapidty than the percentage of land sequestered from growth. As a result, cities having more than 20% of their potential suburban land removed from growth have a housing inflation rate about 6 percentage points above unrestricted cities, ceteris paribus.

On the basis of the analysis here we cannot conclude that growth restrictions are bad on welfare grounds. Some would argue that there are benefits from controls such as social costs associated with growth that do not have to be borne. Certainly homeowners in communities that put controls in place gain from their capitalization effect on property values. Would-be owners who are priced out of such communities by the inflationary aspects of controls are losers. A careful study is needed before the welfare effects of suburban land-use restrictions can be fully assessed,

One conclusion that foliows from the immediately previous comment is that there may be an overstatement in housing inflation rates such as are reported for the period 1975-1978. While it is true that growth restrictions lead to higher prices, it may well be that there is a quality differential between suburban housing located in or near growth-controlled communities and housing that is not The Tiebout model suggests that people with a choice who choose to migrate to communities in the former category and to pay higher prices for the assurance of lesser crowding later or are getting a product, or an attribute of one, not picked up in the CPI.

NOTES

[1] The authors gratefully acknowledge helpful comments from Brian J.L. Berry, Adonis Yatchew, and Thomas L Steinmeier. NSF Grant SOS 79-09370 helped support the research.

[2] That the vertical distance separating b and a is a good proxy for price inflation between t and $t + 1$ in the no-growth-restriction case can be easily shown by:

$$\ln \tilde{P}_{t+1} - \ln \tilde{P}_t = \ln\left(\frac{\tilde{P}_{t+1}}{\tilde{P}_t}\right) = \ln\left(\frac{\tilde{P}_t + \tilde{P}_{t+1} - \tilde{P}_t}{\tilde{P}_t}\right) = \ln\left(1 + \frac{\tilde{P}_{t+1} - \tilde{P}_t}{\tilde{P}_t}\right) \cong \frac{\tilde{P}_{t+1} - \tilde{P}_t}{\tilde{P}_t}$$

[3] "Residenrial Construction: Three Years of Recovery," in *Survey of Current Business*, June 1978, pp. 18-28.

[4] In the case of the pooled regression for the two pairs of "levels" equations in (1)—for 1975 and 1378—we restricted variances of the two residuals to be the same. It should be pointed out that this is not a necessary assumption. We might just as well have assumed different variances but

identical parameters. In point of fact, the assumption of common variances was not unreasonable—the sum of squared residuals was approximately the same for the separate equations of (1).

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Short Papers

The Effect of Growth Control on the Production of Moderate-Priced Housing

Seymour I. Schwartz, David E. Hansen, and Richard Green

INTRODUCTION

Growth control programs that restrict the supply of new housing, and hence, the rate of population growth of the community, can be expected to increase the price of new and existing housing in the growth control community. Our study of the growth control community of Petalurna, California (Schwartz. Hansen. and Green 1981). detected statistically significant price increases for new houses by comparing price changes for standardized houses in Petaluma *to* price changes in two nearby communities.[1] This statistical analysis did not, however, tell the entire story about the effects of the program on housing production and OR housing opportunities, especially for moderate-income homebuyers.

To many policymakers the distributive consequences of growth control, especially those affecting lower-income households. are of great concern. The important questions these policymakers want answered are: What is the effect of the growth control program on the availability of lower-priced housing. and how are the housing prospects of moderate-income families affected? To provide the information with which to answer these questions. we examined the characteristics (price and floor area) of the houses actually built in Petaluma and a neighboring cornparison city—Santa Rosa- between 1970 and 1976. In this note we present the results of this analysis and discuss the reasons for the observed differences between cities. First, we describe the characteristics of Petaluma's growth control program and discuss our methods.[2]

Land Economics. Vol. 60. No. 1. February 1984
0023-7639/84/001-0110 $1.50/0

PETALUMA'S GROWTH CONTROL PROGRAM

Petalurna was a small agricultural trading center (14,035 population in 1960) until the mid-1960s. when rapid suburban growth from San Francisco (40 miles south) and Marin County. spread to Petaluma. This growth. which increased Petaluma's population to 24,870 in 1970, strained the capacity of the sewerage system and caused serious overcrowding in the schools. events which were largely responsible for Petaluma's adoption *of* a pioneering growth rate limitation program in 1972.

Petaluma sought to limit its growth rate by establishing a housing quota of 500 new units per year (single-family plus multi-family) from 1973 through 1977 (City of Petaluma. 1972). Developers competed in an allocation process in which a citizens review board evaluated subdivision proposals according to two major sets of criteria: one to ensure that adequate public services were provided by the

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[1] An hedonic model of house price was used for the comparison of price changes. The standardized houses were statistical composites.using the average *of* each *of six* house characteristics. Price changes were compared for several combinations of housc and lot size. See Schwartz. Hanscn, and Green (1981) for details.

[2] A detailed discussion *of* the growth control program iscontained in Schwartz. Hansen. and Green (1981).

developer, and the other to ensure that house and subdivision quality and other goals sought by the city were attained. Housing allocation and building permit data indicate that the growth control program reduced the number of housing units built. In the first three years of the program only 37% of the single-family units proposed by developers received allocations (permissions to build). Also, during this peiiod the number of building permits issued was 67% less than the number issued during the three years before growth control.

The comparison city of Santa Rosa is 15 miles north of Petaluma. which is at the outer limits for most commuters to San Francisco. Santa Rosa is larger than Petaluma (1960 population of 31.027) and has a considerable industrial and commercial base of employment. Santa Rosa did not change its policy of encouraging growth during the period of this analysis nor did it experience any other changes that would rule it out as a suitable control for this comparison between cities.

DATA AND METHODS

Sales prices and physical characteristics of new houses sold in Petaluma and Santa Rosa between 1970 and 1976 were obtained from the Society of Real Estate Appraisers. Our sample included approximately 75% of all sales Curing this period. The total number of cases was 597 for Petaluma and 784 for Santa Rosa. Sales prices were deflated to 1970 values by means of the Boeckh construction cost index,[1] which closely followed the consumer price index.

We calculated the annual cumulative distribution of sales prices and floor area for housessold in the two cities between 1970 and 1976. To determine what percentage of the houses could have been purchased by moderare-income households (or lower). we calculated the maximum price that such households could have afforded to pay. California's Department of Housing and Community Development defines the moderate-income range as between 80% and 120% of rhe county's median income for it household of four people. To calculate the maximum price that a household in this income range could have paid, we assume that the household spends 30% of its gross income for housing and that the buyer makes a 20% down paymeni and takes a 30-year. constant-payment loan at the interest rate that prevailed in that year (in the range of 9.0% to 9.75% for FHA loans). Under these assumptions the maximum price that a moderate-income household could have paid is approximately $25,000 in 1970 dollars. Taking this as the cutoff (criterion) price. we compare the results in Petaluma to those in Santa Rosa. Comparing Petaluina to another city is necessary to eliminate outside events (other than Petaluma's program) as possible explanations for the result.[2] If the pattern of changes in Petaluma is different from that in Santa Rosa and is in the direction predicted by theory. we can conclude that the changes were due to growth control. The degree of confidence in such a conclusion will depend. of course. on the appropriateness of the comparison city. It is important to note that new houses built under the growth control program in Petaluma did not appear on the market until 1974, so we consider the period 1970–1973 as pre-growth control and the period 1974–1976 as post-growth control.

RESULTS

In Petaluma the percentage of houses that sold for less than $25,000 ($1970) was between 48.3% and 56.7% before growth control: aftergrowth control it dropped to 15.2% in 1974, 2.3% in 1975 and 3.3% in 1976 (Table 1). In 1976. 68.2% of Petaluma houses sold for more than $30,000 whereas before growth control no more than 21.7% sold for more than $30,000 ($1970); in three of the four years before growth control fewer than

[1] The Boeckh index is published in U.S. Department of Commerce. Bureau of Industrial Economics. *Construction Review*.

[2] Since a true experiment using random assignment is impossible in this situation, we use a quasiexperiment. where the comparison city of Santa Rosa serves as a control. See Cook and Campbell (1979) for a detailed discussion of quasiexperimental methods

TABLE 1

DISTRIBUTION OF SALES PRICES OF NEW HOUSES: CUMULATIVE PERCENTAGE OF HOUSES SOLD AT OR BELOW THE STATED PRICE[a]

Sale Price Less Than:	Year:	Cumulative Percentage[b] 1970	1971	1972	1973	1974	1975	1976
				PETALUMA				
$20,000		9.1	12.5	13.3	6.7	4.4	0.0	0.0
25,000		52.1	54.2	48.3	56.7	15.2	2.3	3.3
30,000		97.8	92.5	78.3	96.2	58.7	51.2	31.8
35,000		99.9	100.0	98.3	98.1	93.5	88.4	74.7
				SANTA ROSA				
$20,000		26.2	21.5	7.1	5.1	10.4	5.8	10.7
25,000		43.1	38.7	32.9	36.5	39.9	37.4	37.5
30,000		66.2	68.8	78.6	69.4	66.4	67.8	59.8
35,000		78.5	95.7	94.3	88.3	85.3	87.9	74.1

[a]Prices are in constant 1970 dollars.

[b]We do not show the remaining price category which results in an entry of 100% in the last row because our interest is in the lower priced houses. The reader can easily calculate the remaining percentage of houses that sold for more than $35,000 (the difference between the last entry and 100%).

8% of Petaluma houses sold for more than $30,000 ($1970). The contrast to Santa Rosa is striking. There, between 32.9% and 43.1% of the houses sold for less than $25,000 over the entire period (1970–1976). From 1974 to 1976 (the post-control period). between 37.4% and 39.9% of Santa Rosa houses sold for less than $25,000. Thus, the percentage of "affordable" housing dropped from about 50% to less than 5% in Petaluma but it remained high—nearly 40%—in Santa Rosa. These data provide strong evidence of the shift in Petaluma's housing away from the low end of the market after growth control.

The data for floor area document the disappearance of the small house in Petaluma after growth control. This is not surprising since hedonic price studies have repeatedly shown that floor area is the most important determinant of variation in house price. If we consider 1,400 square feet to be a small house, we see that the percentage of small houses built in Petaluma dropped from about 39% in 1970 and 1971 to 11.0% in 1976. The percentage of very small houses (below 1,200 square feet) dropped from about 20% in the 1970-1972 period to 1.1% in 1976. Again the results from Santa Rosa are in sharp contrast. The percentage of Santa Rosa houses smaller than 1,400 square feet averaged 32.1% before growth control and 32.8% after growth control. The percentage of very small houses was greater in 1975 and 1976 than in any previous year except 1970.

It is clear that small, lower-priced new houses nearly vanished from Petaluma after it imposed growth control, but that did not happen in the comparison city of Santa Rosa during this same period. There are two major reasons why the disappearance of low-priced houses in Petaluma can be attributed to its growth control program. First. the criteria for evaluating development proposals and awarding housing permissions (atlocations) were heavily weighted toward quality and amenity items. More than 50% of the maximum number of points awarded in the rating of subdivision proposals were for such items as architectural design quality, site design quality, character of landscaping and screening. provision of foot or bicycle paths and equestrian trails, and provision of usable open space (City of Petaiuma 1972. General Plan. Housing Element). Second. the city council made it clear to builders in the first year's allocation process that it wanted subdivisions of high quality. Proposed subdivisions of modest quality were rapidly eliminated from

TABLE 2

DISTRIBUTION OF FLOOR AREA OF NEW HOUSES: CUMULATIVE PERCENTAGE OF HOUSES WHOSE FLOOR AREA IS AT OR BELOW THE STATED SIZE (SQUARE FEET)

Floor Area Less Than:	Year:	Cumulative Percentage[b] 1970	1971	1972	1973	1974	1975	1976
				PETALUMA				
1200 sq. ft.		20.4	22.5	20.0	10.6	6.5	2.3	1.1
1400		38.7	39.1	28.3	17.9	23.9	18.6	11.0
1600		58.4	56.7	43.3	13.3	28.3	25.6	23.1
1900		81.0	77.5	71.7	M.3	73.9	55.8	39.6
				SANTA ROSA				
1200 sq. ft.		4.6	6.5	10.0	11.0	14.0	17.2	16.1
1400		36.9	34.4	15.7	31.4	34.3	35.6	38.6
1600		52.3	57.0	51.4	54.0	62.9	57.5	55.4
1900		70.7	84.9	x2.9	86.9	86.7	81.0	81.3

consideration (Tarr 1978). We conclude, therefore, that Petaluma's growth control program effectively eliminated the production of lower-priced housing in that city.

POLICY IMPLICATIONS

Many local government decisionmakers perceive important benefits to their communities from growth control, including enhanced environmental quality and amenities, maintenance of "small town character," and better public services and fiscal status[a] (Rosenbaum 1978; Johnston 1980). However, focal decisionmakers may not be aware of, or concerned about, the costs of growth control because most of the costs fall upon individuals who live outside the growth control community or on renters in the community. Since the losers are usually in lower income groups than the beneficiaries of growth control such programs have potentially serious equity consequences (Schwartz 1982). To the extent that the losers lack political power to influence decisions within the growth control jurisdictions, the stage is set for confrontation between state and focal policymakers over the acceptability of growth control programs. Recent actions by some local governments, as well as by state legislatures and state courts are evidence of growing concern for the equitv consequences.

In California and New Jersey, the state supreme courts have held that it is not enough for a growth control program to provide benefits only to residents of the enacting community.[b] If challenged in court, a community must show that its program does not create negative *regional* impacts on the supply of lower-priced housing; if it cannot do so, the program will be considered exclusionary. In California, the legislature mandated that local governments act affirmatively to meet their fair share of regional housing needs for all income groups (Chapter 1143, California Statutes of 1980). The legislature further placed the burden of proof on local governments that enact growth control ordinances to

[a] Less socially acceptable reasons for restricting growth may exist but are not usually expressed. For example, Ellickson (1979) asserts that suburban growth controls are designed to enrich existing homeowners who, in effect, form a housing cartel to restrict the supply of new single-family houses. The large literature on exclusionary land use practices points to the protection of property values as the primary motive for such practices (Delafons 1969; Babcock and Bosselman 1973).

[b] In California the relevant case is *Associated Homebuilders of Greater East Bay v. City of Livermore*, 18 Cal 3d 582, 557 P. 2d at 483, 135 Cal Reporter 41 (1976). In New Jersey the relevant case is *Southern Burlington NAACP v. Township of Mount Laurel*, 161 N.J. Super ct. Law Div. 317, 391, A.2d 935 (1978).

show, in any court challenge, that the ordinance "is necessary for the protection of the public health, safety, or welfare of the population" (Chapter 1144, California Statutes of 1980).[7]

Although California and New Jersey are at the forefront of efforts to eliminate exclusionary land development practices and provide affordable housing, other states seem likely to follow suit. Consequently. stringent growth control programs may not be able to withstand legal challenges unless the enacting communities also make special efforts to provide affordable housing to lower-income households. Petaluma's program withstood a legal challenge shortly after it was adopted, based largely on the city's goal of providing between 8% and 12% of new housing in a price range affordable to low- or moderate-income households. Our analysis shows, however, that Petaluma failed to achieve this goal. Instead, its growth control program nearly eliminated new lower-priced single-family housing. Petaluma's only incentive for encouraging affordable housing was by awarding, in its evaluation of proposed developments, up to 15 points out of a total of 130 points for the provision of affordable housing. This incentive was insufficient because most of the remaining points were awarded for house and subdivision quality and amenities. A stronger commitment must be made by the local government if affordable housing is to be built. Other jurisdictions—for example. Davis. California—have combined a stringent growth control program with stronger incentives for providing affordable housing (Schwartz and Johnston 1983). However. the ability of even these stronger incentives to overcome the adverse impacts of growth control programs on affordable housing is very much in doubt.

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THE EFFECTS OF GROWTH MANAGEMENT ON THE HOUSING MARKET
A Review of the Theoretical and Empirical Evidence

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ABSTRACT: *The no-growth or slow-growth policies that have spread rapidly in the past 15 years vary in form and include explicit population targets, rigid development controls, and refusal to provide expanded public services, among other techniques. The purpose of this article is to review these efforts. The article first presents a review of the economic theory that illuminates the economic motivations for such controls and identifies some of the major impacts to be empirically assessed. The next part of the article focuses on the housing price, production, and equity effects of growth control, as documented in the empirical literature. The article concludes with a section devoted to policy implications.*

INTRODUCTION

Policymakers in American cities have significantly changed their attitudes regarding urban growth. For approximately 20 years after World War II, strong pro-growth attitudes dominated. Growth was seen as necessary for providing expanded employment opportunities and desirable because it would augment city budgets and provide greater social, cultural, and economic diversity. In the 1960s and 1970s the perception of environmental deterioration as a result of urban growth emerged and cities began to search for ways to obtain higher quality residential environments. Initially, concerns were focused largely on physical features exemplified by air pollution and noise levels. However, in the mid-1970s, a number of suburban communities began to feel that

JOURNAL OF URBAN AFFAIRS, Volume 9, Number 1, pages 63-77.

ISSN: 0735-2166.

continued growth threatened a wider range of amenities important to the quality of life. Limited or no-growth ordinances were seen as a means to maintain a pleasant, small-town atmosphere and lifestyle as well as to provide for open space, greenbelts, attractive neighborhoods, minimal traffic congestion, and high quality public services at reasonable tax levels. Controls of this type have now been enacted in a large number of suburban communities in every region of the country. Indeed, the fervor to stop or slow growth became as strong in the 1970s and 1980s as that of the pro-growth movement in the 1960s.

The no-growth or slow-growth policies that have spread rapidly in the past 15 years vary in form and include explicit population targets, rigid development controls, and refusal to provide expanded public services (e.g., schools, water supplies, or sewage treatment facilities), among other techniques. Such policies now find support in urban areas in every region of the United States, even in areas that previously encouraged rapid growth. Dowall (1982) identified 567 local governments across the country that had some form of growth control, and Segal and Srinivasan (1985) found that nearly two-thirds of a sample of 51 SMSAs from every region in the United States had growth restrictions. Although an average of 12% of the available suburban land was set off limits to growth in their sample, in some cities growth was barred from 30 to 40% of the surrounding land.

Growth controls are, of course, not a new phenomenon. Local governments have long had the power to regulate new developments through zoning and other land use controls. What is new is the introduction of specific growth targets or limits and the pervasiveness of such policies. For example, a recent survey of 64 San Francisco Bay area jurisdictions showed that since 1970, approximately half of the jurisdictions had employed some sort of moratorium on residential development for some significant period of time (Gabriel, Katz, & Wolch, 1980).

Although growth control policies are now widespread, Solomon (1976) was forced to conclude in his review of the literature that virtually nothing was known about the size or nature of the impacts of growth control. Since that review there have been a number of efforts to evaluate the impacts of such controls on the price, quantity, quality, and other aspects of housing from both theoretical and empirical perspectives. The purpose of this article is to review these efforts. The article first presents a review of the economic theory that illuminates the economic motivations for such controls and identifies some of the major impacts to be empirically assessed. The next part of the article focuses on the housing price, production, and equity effects of growth control, as documented in the empirical literature. The article concludes with a section devoted to policy implications.

THE THEORETICAL FOUNDATION FOR GROWTH CONTROL

The reduction in social well-being that may result from unguided or uncontrolled urban growth, and therefore the justification for growth controls, is based on several economic arguments. For purposes of summary and analysis, these arguments may be grouped into three broad categories. First, secondary consequences or side effects of urban growth as exemplified by congestion occur and may be overlooked by decision-makers. Economists refer to these effects as externalities and demonstrate that if

has been a major source of increased personal wealth for middle-income Americans, resulting in a major wealth redistribution, between owners and renters (Sternlieb & Hughes, 1980). Renters may also incur significant losses in other more indirect ways. For example, rental units may be located in inferior school districts or in areas less accessible to employment opportunities. Steger (1973) found, for example, that limited housing choice of central city residents results in a 5% loss of income because of additional commuting costs.

Growth control programs may also create important jurisdictional inequities When growth is discouraged in one community, it may be shifted to surrounding jurisdictions. Even if housing prices are not increased. if public services are producsd under conditions of increasing costs, this will place a greater burden on surrounding communities. In such cases, it may be in the best interest of surrounding communities to adopt growth control measures also. Schwartz (1982), €orexample, observed that "there is evidence to suggest a chain reaction of growth control adoptions in communities between San Francisco and Sacramento following several years after the pioneering programs of Petaluma and Davis" (p. 232).

Growth control programs have pronounced effects on the availability of low- and moderate-income housing. In unique urban environments where permission to build is based on amenity and design characteristics, affordable housing for low- and moderate-income families may vanish. In metropolitan regions where interconnected housing markets lead to similar types of controls in many adjacent communities, low- and moderate-income families may be forced by such controls to live in neighborhoods that further disadvantage them with respect to job opportunities and education. A postponement or elimination of the opportunity for home ownership may also result in a significant redistribution of income.

CONCLUSIONS AND POLICY IMPLICATIONS

The evaluations of the impact of growth controls suggest that while these efforts may have helped maintain the desired community character, housing prices have increased and in many cases the availability of low- or moderate-priced housing has declined substantially or even disappeared. This combined with national inflation and high mortgage interest rates has created a real crisis in housing markets. Currently, a very large percentage of families cannot afford to purchase housing. An expanded number of households has been forced to rent and/or reduce housing size or quality. Higher prices in the rental market also make the accumulation of capital for future purchase more difficult. The long-term viability of growth control programs consequently requires that some means be developed to offset the price, equity, and extrajurisdictional impacts of these programs.

A number of policy recommendations have been advanced. For example, Ellickson (1977) proposed a judicial remedy recommending that communities be allowed to pursue growth control measures but that state courts use the taking clause in their constitutions to entitle landowners and housing consumers to sue for damages. Certain landowners could recover damages for land value losses and home buyers or renters could bring class action suits to recover price increases brought about by growth

control. If the growth control community could demonstrate that its program was both efficient and equitable to consumers of housing, it would not be subject to damages.

As an alternative to Ellickson's judicial remedy, a number of local governments have sought to overcome the undesirable side effects by establishing inclusionary housing programs which either provide incentives for or mandate the construction of low- and moderate-cost housing. In a recent review of inclusionary housing programs, Schwartz and Johnston (1983) provided evidence for the inadequacy of nationwide efforts to provide housing for low- or moderate-income families. For such programs to be successful, Schwartz and Johnston argue that they must: (1) mandate moderate-cost units from medium- to large-scale developers and require fees from most other developers; (2) screen buyer and renter applications to maximize social benefits; (3) control resale price in order to retain units at moderate prices; and (4) provide substantial economic incentives to developers (p. 19).

As an alternative, or perhaps in conjunction with such programs, cities might sell local revenue bonds for the purpose of providing low-interest loans to moderate-income buyers. Below market interest rates are, however, in general inadequate in bringing housing costs down to the point where they are affordable to low- and moderate-income families. Unfortunately, many of the forces that underlie the inflation in housing costs are beyond the control of local governments. Hence, if the provision of low- and moderate-cost housing is considered a desirable social goal, a national housing policy committed to assisting local governments in this effort may be necessary.

While a combination of federal efforts and inclusionary housing programs by local governments might be workable, the larger problem of efficiently providing housing in a metropolitan region still remains. It is highly unlikely that aggregate housing provision will match needs in an optimal manner when individual political subdivisions institute growth controls and when housing construction is the primary source of control. Growth control and inclusionary programs repress or distort normal free market production and reduce the normal benefits of trickle-down to lower-income buyers and renters. In addition, these programs are enacted by submetropolitan communities which are not motivated to consider the larger housing needs of the metropolitan community. While there is a real need for efforts to maintain the quality of local environments, metropolitan areawide governments are still too weak to ensure that such efforts will take cognizance of the benefits and costs to the larger society. All too often, a disproportionate portion of the costs of such programs fall on the lowest income groups who can least afford them.

NOTES

1. The graphical analysis draws on Ellickson's 1977 article in the *Journal of* Law *and Economics.*

2. The actual increase could be more if the price were set by market forces that did not consider the congestion *costs.*

3. This raises one of the difficult theoretical and empirical issues in the growth control literature. If antigrowth policies raise housing prices within municipal boundaries, these higher prices will make housing in neighboring jurisdictions more attractive to consumers. The result would be an increase in the amount of housing built outside the boundaries, and potentially. an increase in housing price in these jurisdictions as well. From a research point of view, this

frequently causes difficulties since cities with unique environmental settings that impose controls can be compared most easily with cities in the same environment without controls. However, if the cities are close enough to have similar environments. then their proximity also integrates their housing markets so that little or no price difference can be observed over time. When comparisons are made between cities that are distant enough to have separate housing markets. environmental amenities are less likely to be comparable. From a practical or policy point of view, the impact of growth control on surrounding communities means that one jurisdiction can impose costs on neighboring jurisdictions who are not free to express their preferences in the ballot box.

4. Some Boulder, Colorado, residents have claimed that due to growth controls, high-density condominiums and apartments have replaced single-family units with the result that this city is less family oriented and more oriented toward singles lifestyles.

5. Many of the empirical studies of growth control have used California data. Because of the atypical housing markets in that slate, it is possible that the results may not be generalizable. However, the articles which do focus on growth management in other parts of the U.S. (e.g., Butler & Myers's [1984] article on Austin, Texas, and Knaap's [1985] study of Portland, Oregon) present findings which are consistent with those of the California studies

6. One externality associated with some growth control programs is delays resulting in higher construction costs. Although this issue is beyond the scope of this paper, it is worth noting that these costs may be substantial. The Rice Center for Community Design and Research (1979) estimated that government regulations in the Houston housing market resulted in costs of $1,400 to $2,100 for a 13-month delay. The Construction Industry Research Board (1975) came up with substantially higher estimates of a delay prior to construction of $1,027 per month.

7. Rosen and Katz (1981) criticized this study because land price increases were completely attributed to growth control ignoring inflation and other market factors and because there was no control city to allow for a determination of increases in profits and costs resulting from growth management.

8. Some of the econometric problems include: autocorrelation, simultaneous equation bias, specification error, and partial use of forecasted rather than actual data.

9. It is common for researchers to have concentrated on the price effects and ignored the production effects. More research needs to be done investigating the growth control effect on housing quantity and not just on housing price.

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LAND PRICE INFLATION AND AFFORDABLE HOUSING

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Prices for standard lots and acreage were collected for 1975 and 1980 in 30 metropolitan areas and then analyzed, using multiple regression, to identify factors which would explain variations among metropolitan areas. Extreme price variations were observed. For example, from 1975 *to* 1980, the price of a standard residential lot increased as little as 31% in one area, white the price rox 176% in another. Over 80% of the variation in lot price increases was explainable by a model combining land supply and demand factors. In their order of importance, the factors were: (1) an index of regulatory restriction, (2) population increases, (3) per-capita income increases, and (4) job increases. The analysis suggests that public regulatory, infrastructure and tax policies can significantly affect land supply and demand and, in turn, prices. Communities that choose to manage growth must monitor land supply and demand and adjust their policies to ensure competitive noninflationary land markets. Otherwise major increases in land prices for housing and businesses may result.

INTRODUCTION

Land comprises a significant portion of the cost of housing and of many businesses. Over the decades, that proportion has risen and fallen depending upon the cost of land, the amounts utilized, and changes in other cost components. In 1980 it appeared that land costs had risen sharply in many growth markets. While the U.S. Census showed that land as a component of housing cost was around 21% nationwide, in some markets, such as the West Coast, Front-range and Sunbelt, there were reports that land comprised 40% of single-family housing costs. What makes these increases so important is that they were in the areas of the nation where housing demand was greatest

The reason for concern over rising urban land prices is simple: Housing quality and home ownership are threatened and business costs are increased. Besides contributing *to* problems of housing affordability, a drop in housing production results in reduced business activity, and increases in housing costs can lead *to* increased wage demands, thus significantly affecting the economy.

To find out if land prices really were increasing, and , if so, why, the authors collected price data from 30 metropolitan areas and, through correlation and multiple-regression analysis, examined the reasons for variations in levels and trends in land prices,' The principal research question was to what extent did demand versus supply factors explain changes in residential land prices. What follows is a brief three-part summary of the exploratory research. First, a description of the variation in land prices between metropolitan areas; second, a report on efforts to identify why prices vary between markets; and finally, some hypotheses are offered *on* the operation of land markets. The research methodology is described in the text and additional details are provided in the appendix.

Urban Geography, 1985, 6, 1, pp. 27-47.

LAND PRICES

A major difficulty in understanding land markets has been the absence of comparable land price data. Data collection has been hampered by the fact that no two parcels are exactly alike; each piece is unique in terms of its size, location, topography, sub soil conditions, public regulations, supporting services, ownership, and future utility. Prices vary with these attributes and with the conditions of sale.

Analysts have struggled to develop price data by manipulating sales data or property assessment records, performing residual cost calculations or projecting future returns for raw lands. None of these efforts has produced a suitable record of comparable prices for different areas of the country and for particular years. The U.S. Census Survey of Construction includes one item on residential land costs; however, it is not published because the response rate is lower than the Census considers acceptable. The Federal Housing Administration (FHA) publishes land cost data for FHA-insured new and existing single-family properties but the sample is not representative of all single-family housing Finally, the U.S. Department of Agriculture publishes data on the value of farm acreage but this series excludes land at the urban fringe.

Faced with poor data, the authors developed a survey methodology.[2] It involved defining two types of standard land parcels and asking homebuilders and residential appraisers in 30 metropolitan statistical areas (SMAs) for estimated prices. Since the greatest interest was in land as a component of housing costs, the work focused on *two* types of parcels considered key to housing production:

> An improved *single-family lot*—defined as having 10,000 square feet, zoned for single-family, with utilities to the lot, located in an area attractive to buyers of mid-price, single-family homes and within 20 minutes of a major employment area.
>
> *Unimproved acreage suitable* for single-family *use*—defined as parcels of 20 to 100 acres, with utilities available to the site at negligible cost, at the urban fringe, within 20 minutes of a major employment center, without any adverse environmental conditions, and not in a prestigious area.

The definition of a standard parcel established a single image of a piece of land for which an expert could then estimate a probable price. By using the same definitions, prices also could be compared from one market area to another.

The SMAs[3] were selected to represent all sections of the country and varying sizes and growth rates (see Fig, 1). The sample was not random. The nation's largest metropolitan areas were omitted because of the expectrd difficulties respondents might have with the survey. No special treatment was given to multi-centered areas. The authors feel, however, that the areas selected reasonably represent the universe of metropolitan market areas.

For each metropolitan area, approximately 25 to 40 real estate experts were identified from referrals and professional membership lists. The experts were mailed a survey describing the standard parcels and asked to estimate prices for both 1975 and 1980. The average response rate was 10, or about 35%, with a high of 16 and low of 4. In general, individual price estimates for an area were consistent The prices cited in this paper are the median values provided by the experts.

Following are the findings on land price variations for residential lots and raw acreage among 30 metropolitan markets.

1975-1980 Percent Increase in Raw *Land* Prices
Explanation of Inter-Metropolitan Land Price Variations

Independent variables (in order of importance)	Improvements *in* correlation with additional variables R^2	Adj. R^2
1. Percentage increase in jobs, 1975-1980	.331	.302
2. Regulatory restriction rating, 1980	.496	.445
3. Percentage increase in income, 1975-1979	.570	.508
4. Physical restriction rating	.599	.519
5. Percentage increase population, 1975-1980	.632	.536

increase In raw land prices= 121.1 + 1.0 (job Inc.) -24.3 (reg. rating) +4.0 (pay inc.) - 26.8 (phys. raring) + 3.0 [popu. inc.)

Standard deviation 48.9; cares 28, omitted San Jose and Cincinnati, the first because *of* extreme values and the second *for* lack *of* 1975 price *data.*

Supply and demand factors represented by regulatory restrictions and increases in population, jobs, and income were the major factors influencing the rate of increase and land prices. The explanatory power of the raw land model was lower than that for improved lots since it is believed that the raw land market is less directly infiuenced by current changes in supply-demand conditions and more influenced by ownership characteristics and longer term market expectations.

It is important to stress, at the conclusion of this analysis, that the data collected and its manipulation were exploratory at best. Additional research is needed *to* confirm or refine the observations. Areas for possible improvements include randomly selecting the sample of metropolitan areas, refining the standard parcel definitions, and testing the price survey methodology. More time points are needed. Finally, much work is needed on defining and testing additional explanatory factors. The regulatory restriction rating needs refinement, and *other* supply measures need to be developed.

SOME SPECULATIONS

In spite of the methodological limitations, the preceding results support *two* propositions regarding urban land policy.

1. Prevailing Land Prices May Be significantly Affected by the Aggregate Effects of Government Policies

It is well known that the value *of* an individual parcel can be increased or decreased by a change in zoning which affects the economic rate of return from the parcel. Similarly the provision *of* a sewer, road, or transit line can impact a parcel's value. What this study suggests, and *is* not commonly recognized, is that at a much larger scale the combination *of* local policies (regulations, infrastructure investments, taxes) probably changes the overall balance of land supplies to demand and thereby raises or lowers the average price for land.

The recognition in the 1970s of strong connections between urban development policies and objectives such as encouraging revitalization, infill and compact development, reducing pollution, protecting agriculture, and balancing local budgets has resulted in subtle but far-reaching changes in land markets. Generally, local policies have evolved from accommodating growth to the control of growth. New policies include trying to direct the amount, type, location, and timing of private development. In locations where special efforts have been made to manage development, it is likely that the public sector has greatly reduced the supply of land available for development Especially serious land/housing price problems occur when local policies seek economic growth but limit population (residential) growth. If a community adds jobs, the demand for housing must increase. If the amount of land for residences is limited and densities are kept low, there is bound to be increased land competifion and price inflation.

Public officials, interest groups, and citizens need to balance their desire for compact orderly growth and the protection of the environment and agricultural lands with policies which will also assure competitive land markets with well-located affordable sites for homes and businesses. For example, the San Francisco Bay area is now coming to this realization. The Bay Area Council, an association of 300 leading businesses, has issueo a strong call for balanced land policies. San Francisco and Sunnyvale, California have responded by adopting policies linking economic expansion and housing Much more thought needs to be given to how to achieve and maintain these balances.

2. *There Are Many Land Markets: public Policies and Economic Cycles Are Likely to Affect Them Differently*

An interesting finding of the study was the difference in the absolute prices and rates of increase in prices for the two land types. The median price of improved lots increased an average of 66.4% while the price for raw acreage increased 92.7%. Why would one increase be so much more than the other?

One explanation of the higher increase in raw land prices is that the price of raw land is only one of the factors affecting the price of an improved lot. There are other costs of developing land. The costs of converting raw land to the developable stage may not have risen as much as the cost of the raw land itself. if they did, the price of developable land would have risen as much or more than the price for raw land.

Another explanation is that the owner-investors of improved land and the owner-investors of raw land are influenced by different forces. Each owner-investor group has different objectives and different financial capabilities and therefore public policies and economic cycles affect each differently. For example, developers specialize in purchasing raw land and, through a process of rezoning, subdivision, and the construction of streets, water systems, etc., produce improved lots. Land improvement involves considerable equity investment plus funds at relatively high interest rates. The developer is impatient, if not obligated, to seli his improved lots within a short term. His financial success is dependent upon maintaining a cash flow. If there is an excess of improved lots relative to demand, the deveioper is forced to cut his profit An excess of tots occurred in the late 1970s and was exacerbated by the onset of the housing

recession of the early 1980s. The 66% increase in lot prices probably only reflects the 52% inflation for the 5 years, the costs of increasing focal development fees, and a modest profit, if any. Data for price changes from 1980 to 1983 might reveal no changes or even declines where developers went bankrupt.

In contrast, the owners of most raw devetopable land are more likely to be patient, long-term investors who are financially capable of withstanding short-term drops in demand and who look for long-term price appreciation. A recent study of fringe area land owners found tfiat as much as 50% of the improved suburban and rural fringe land was held by the current owner for 8 years or more (Brown, Phillips and Roberts, 1981), and it was also estimated that only one quarter to half of the owners were interested in selling their land at any one time (Brown et al., 1981; Real Estate Research, Inc., 1982). The carrying costs for raw land are modest as there are usually few improvements. Taxes also tend to be modest Such owners don't have to sell to survive.

Thus while the price of improved lots is especially sensitive to national economic conditions, the price of raw land may be less so. As others have suggested, it appears that the price of land, especially that of raw land, may follow a ratchet pattern of moving upward but seldom downward since few parcels 2re subject to forced sales.

Beyond these two explanations, there is the possibility that the imposition of restrictions on the raw land that may be developed can produce conditions of narrow or quasi-monopoly control of available raw land Only a relatively small proportion of raw land is available for sale at any given time, as noted above. If this pool is further diminished through growth controls, the number of remaining possible sellers may be reduced enough to grant them significant marker power.

We do not know whether such additional concentration of market power was occurring between 1975 and 1980. Analysis of the types of growth controls imposed in specific areas and the course of raw land prices in those areas might provide some evidence. These remain important questions for further research.

CONCLUSION

In many market areas, land for building is becoming an ever larger cost in housing and other development when there is no general land shortage. If any one point stands out from the findings of this research, it is that policy makers should pay more attention to land cost as a component of housing, shopping center, industrial park, and office costs.

We monitor employment levels, money supplies, and interest rates nationally. The U.S. Department of Agriculture monitors farm and ranch land prices and quantities. But no one systematically monitors urban land prices, much less the factors which might explain urban land market behavior.

Policy makers should know the prices for representative parcels and know more about how public decisions on zoning, the construction of a sewer tine or road, an employment expansion, or adoption of growth limits can affect the development market Current trends suggest that the supply of improved land for building has diminished considerably because of curtailed infrastructure investments, more regulations, and widespread enactment of agricultural land preservation programs. The increased costs in some localities are masked by permitted increases in residential den-

sities. The effect of these shifts, however, is a decline in the package of housing amenities, specifically outside space. Along with this trend, land development as a business has become more difficult to enter and much riskier. Without better knowledge of land markets, public policy may be adding unnecessary costs to housing and businesses that, if extreme, may choke off economic and social progress. The maintenance of healthy competitive land markets is directly related to healthy communities and affordable housing.

NOTES

[1] This article is based upon the findings of a research project jointly supported by the Urban Land Institute (ULI) and the U.S. Department of Housing and Urban Development (HUD) Office of Policy Development and Research. Thomas Black is the ULI Staff Vice President for Research and James E. Hoben is the HUD Chief of Community Planning and Design Research. Frank Dunau, Jay Miller, and Thomas Richardson assisted with the analyses while serving as interns at ULI and HUD. The views and conclusions expressed in the article are those of the authors and not necessarily those of their agencies.

[2] The survey method was first suggested by Professor James Brown of the Department of City and Regional Planning at Harvard University.

[3] One of the sample areas, Boulder, Colorado, was not a metropolitan statistical area at the time of the survey.

[4] Twelve areas were surveyed in 1980 and 18 in 1981.

APPENDIX

Land Price Estimates

The land price data for the 30 metropolitan areas were obtained by requesting real estate experts in each area *to* estimate the price for prescribed standard parcels in their area.

Standard parcels were defined to minimize qualitative and quantitative differences among properties and to permit comparisons across regions. Two standard parcels were specified: (1) an improved single family lot, and (2) raw acreage suitable for single family development. The survey instrument with a description of each standard parcel is reproduced below.

URBAN LAND INSTITUTE RESIDENTIAL LAND PRICE SURVEY

Instructions

We are requesting your best estimates of typical prices for improved single family lots and raw single family acreage as described below. Your answers need not reveal anything about your own business dealings.

Please record two prices for each of the two types of property. The first should be a recent estimate *based* on *1979-80 transactions.* The second should reflect the price of a comparable piece of property in 1975. The latter *can* be based on either an actual transaction or a published average. If information is not readily available for 1975, feel free to substitute another year between 1970 and 1975, but be sure to note that year in the space provided.

It is very important that your estimates refer *to* residential land which reasonably meets the stated criteria for size, location, and other characteristics Estimates based on land which significantly deviates from the standardized characteristics described below will reduce the accuracy of the survey results. Do not feel obligated to provide all four estimates if you do not feel qualified to do so.

The attached form is provided for your answers.

PROPERTY TYPE ONE: Improved Single Family Residential Lot

Characteristics

Size: approximately 10,000 square feet (±1000)
Zoning: single family detached
Location:
- suburban fringe
- within 15-20 minutes driving time of a major employment center (not necessarily the central business district)
- within 2 miles of an existing grade school or bus zone

Development Rights : No restrictions other than toning and building requirements
Utilities to Lot: sewer, water, electricity, telephone
Neighborhood :
- not a prestige area (home prices within $60,000 to $90,000 range)
- area at least 50% developed
- no unusual conditions which might impact the land price such as:
  - o significant pollution (air, water, noise)
  - o environmental hazards (floods, etc.)

o close proximity to amenities such as major parks or shopping areas
Financing: The price should reflect normal financing terms for your area.

PROPERTY TYPE TWO: Unimproved Acreage Suitable for Single Family Residential Use

Characteristics

Size: 20-100 acres
Zoning: Residential, suitable for singte samily detached development
Location:
- developing fringe area
- within 15-20 minutes of a major employment center (not necessarily the central business district)

Development Rights: No restrictions other *than* zoning, subdivision and building requirements
Utilities to Property: Connections to network available at negligible cost
Other Characteristics:
- not a prestige area (home prices within $60,000 to $90,000 range)
- no unusual physical attributes such as slope or soil conditions which would increase the cost of development
- no unusual environmental conditions, e.g. significant pollution or hazards
- no unusual amenities such as extremely close proximity to a major shopping or a recreational area

Financing: The price should reflect normal financing terms for your area.

Approximately 25 to 40 real estate experts in *each* area were identified from referrals and professional membership lists. They included land developers, builders, private appraisers, public assessors, and lenders. The experts were mailed the price survey and asked to estimate prices for 1975 and 1980. The average response rate from each region was 10 or about 35% with a high of 16 and low of 4. In general, individual price estimates for an area were consistent However, to minimize *the* distortion of unusually high or low price estimates, *the* median price estimate was selected as the representative price for a standard parcel. No actual sales were analyzed as part of the price survey or for validation purposes.

Analysis of Price Variations

The 1975-1980 land prices were analyzed by regressing them against a number of factors which might approximate land supply and demand forces in each SMA. A stepwise multiple-regression program was used from the Statistical Package for Social Sciences (SPSS). The selection of factors was limited to readily. available SMA data, except in two cases where factors were developed by the researchers. The independent factors analyzed were:

A. *Supply Factors*

o Physical restriction rating, 1980. (ULI research staff estimate—see article for explanation.)

- o 1980 regulatory restriction rating, 1980. (ULI survey–see article for explanation.)
- o Single family building permits per 1,000 population, 19751980. (U.S. Bureau of Census)
- o Ratio of employment income increase to issued singie family building permits, 1975-1980. (U.S. Bureau of Labor and Census)
- o Ratio of new to existing home loans, 1975-1980. (U.S. Federal Home Loan Bank Board)

B. *Demand Factors*

- o Population, 1980. (U.S. Bureau of Census)
- o Percentage increase in population, 1975-1980. (U.S. Bureau of Census)
- o Employment, percentage increase in 1975-1980. (U.S. Bureau of Labor)
- o Income per-capita, 1979. (U.S. Bureau of Economic Analysis)
- o Percentage increase in per-capital income, 19751979. (U.S. Bureau of Economic Analysis)

C. *Baseline Factors*

- o 1975 improved lot price. (ULI Survey)
- o 1975 raw land price. (ULI Survey)
- o Median new single family home price, 1980. (US. Federal Home Loan Bank Board)

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Land-Use Controls and Housing Costs: An Examination of San Francisco Bay Area Communities*

*David E. Dowall*** and *John D. Landis****

This paper reports on our efforts to gauge the effects of land use controls on housing markets. We discuss how land use controls affect land and housing markets and explain why communities use such controls to restrict development. We present the results of an econometric model created to assess the inflationary effects of land use controls on housing costs. The model is based on data assembled in the San Francisco Bay Area. The model results indicate that density controls and land availability do systematically affect the price of new housing units.

INTRODUCTION

Confronted with continuing increases in the cost of new housing, city planners and urban economists now find themselves re-examining the validity of local land use and development controls. In California, the controversy over land use controls has raged for some five years, sparked to no small extent by housing prices

* Financial support for this paper came from the California Department of Real Estate, the California Air Resources Board and the Construction Industry Advancement Fund.

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which remain the nation's highest. In his widely-quoted 1979 work, *The Environmental Protection Hustle,* Bernard Frieden [1] concludes that in the case of the San Francisco Bay Area, unnecessary growth controls are adding thousands of dollars to the cost of constructing new housing. Perhaps a more important effect, Frieden notes, is that by constricting supply in the face of burgeoning demand, local land use controls fuel the flames of housing inflation. Moreover, those responsible for such restrictive controls often act entirely out of self-interest, for as the price of new housing rises, so too do the prices of existing housing—in the process providing existing landowners with windfall profits. Similar conclusions have been voiced by Gruen and Gruen Associates [2] in a study of the application of growth controls in Petaluma, California, and more recently, by Dowall [3] in a study of land use controls as administered in six representative Bay Area suburban communities.

Academics and consultants, however, are not the only observers to express alarm at the current situation; the State of California has also voiced concern. A recent survey of local land use planning in California, undertaken by the Governor's Office of Planning and Research [4], revealed that over 50% of the 93 cities in the San Francisco Bay Area were actively limiting population growth. To reduce excessive project approval times, the California Legislature in 1977 enacted AB 884, a bill requiring local governments to approve (or reject) major residential projects within one year of the initial submission date. But, because of a variety of loopholes, AB 884 has not been effectively enforced.' Most recently, in an attempt to break the housing supply deadlock, Sacramento legislators have moved to require that individual communities accept their "fair share" of new housing supply, and identify and remove local roadblocks to new construction.[2]

Despite the flurry of legislative activity to promote housing construction and facilitate the availability of affordable housing, little effort has been made to assess the cost and price-push effects of local land use controls on housing. The barriers to such a complete assessment are substantial and center on the lack of good quality land supply and price data, difficulties in delineating meaningful housing submarkets, and separating demand side forces from supply side constraints. This paper reports on our efforts to overcome these barriers and provide some further insights into the relationship between local land use controls and the operation of urban housing markets. The study region is the nine-county San Francisco Bay Area—a metropolitan area containing over 100 independent units of local government with widely divergent approaches to controlling development.

The second part of this paper presents a simple typology for understanding and organizing the effects of land use/development controls on housing markets, and within such a context, provides a further review of recent empirical work. Part three provides some additional insights into the various rationales behind the adoption of land use controls, and reasons why the Bay Area's housing supply

crunch has now reached crisis proportions. Part four presents the results of our empirical analysis of the effects of land use and development controls on new housing prices.

THE DIRECT AND INDIRECT EFFECTS OF DEVELOPMENT CONTROLS ON HOUSING PRICES

California cities and counties have a variety of techniques at their disposal for regulating the type, quality, and timing of new development. In addition to such traditional controls as zoning and subdivision restriction, cities may:

establish urban limit lines, or borders beyond which new development will not be allowed to occur—effectively setting vacant land supplies.

routinely bargain with builders to reduce densities and mitigate negative environmental impacts.

use slope-based/zoning, a technique for reducing hillside development densities.

together with willing farmland owners, establish 20-year agricultural preserves.

levy development fees and charges to pay for the construction of needed on-site infrastructure (sewer and water lines), and also to subsidize the purchase of parkland and the maintenance of local schools.

use growth management programs to airectly limit developmsnt.

To summarize the range of effects of land use and development controls on new housing prices, we have identified four direct and two indirect sorts of effects. Presented in Exhibit 1, these effects are best considered generic; that is, their relative impact on housing prices will depend largely on the level and character of housing demand, the proximity of regulated communities to other jurisdictions, and the cummulative degree of restrictiveness generated by local land use policies.

Direct Effects

The most common way in which land use and development restrictions affect housing prices is by directly increasing builder costs—increases which under most circumstances are passed on to homebuyers in the form of higher prices.

EXHIBIT 1

DIRECT AND INDIRECT EFFECTS OF ENVIRONMENTAL CONTROLS ON HOUSING COSTS

Effect on Housing Costs	Land-Use Controls Most Likely to Generate Effect
Direct Effects:	
Increase in Land costs	Zoning, urban limit lines, density constraints, growth-management timing ordinances and permit programs
Increase in lot-preparation costs	Subdivision requirements, growth-management timing ordinances, dedication requirements
Shifting development costs from public to project	Capital-budgeting programs, fees and development charges, dedication requirement subdivision requirements
Administrative and delay costs	All land-use controls to some extent. Costs increase with the relative complexity of the regulation
Indirect Effects:	
Facilitating monopoly power	Controls that restrict the number of developers operating in communities will allow builders to charge excess housing prices. Regulations act as barriers to market entry, reducing competition in the housing market
Market Reorientation	Restrictions on devetopment often force developers to reorient their projects to higher-income customers

Reducing supplies of vacant land, or restricting the permissible intensity of residential development can substantially affect land costs. As Ohls, Weisberg and White [5] have illustrated, zoning regulations which restrict vacant land supplies below the levels which would normally be exchanged in the market tend to increase land costs. Stull [6] has shown that communities adopting policies which shift land away from residential uses and toward employment-generating uses can expect residential land prices to increase as employment growth accelerates the demand for housing.

Unfortunately, direct empirical estimates of the inflationary effects of zoning on housing prices are not widely available. Accordingly, Davies [7] has used a simulation model of the London, Ontario area to examine how municipal actions increasing the supply of developable lots would affect housing costs. For 1967, Davies tested an increase in the supply of lots equivalent to 50 units, or about 11%. The simulation results suggested a corresponding lot price reduction of about $200 per lot (4.5%). A second simulation experiment for 1973 revealed that the same absolute increase in land supply (250 lots) would generate a $244-per-lot decrease in price (3.4%). But although the effect on lot prices is significant in both cases, the effect on house prices is less than 1%.

Using housing price and land use data for suburban Boston communities, Stull [8] tested the relationship between land use controls and housing prices.

fter controlling for accessibility, housing stock characteristics and the quality . public services, Stull found that housing prices were lower in communities ith greater proportions of vacant land.

In addition to reducing the supply of residentially developable land, zoning :ts to restrict development intensity. While large-lot zoning, on the one hand, nds to reduce the per-acre price of raw land, such reductions in price may be ffset by higher land requirements. Interpolating from Peterson's empirically etermined land-price gradients for Fairfax County, [9] Virginia, illustrates the otential cost effect of large-lot zoning. At a distance **of** ten miles from the ur- an center, Peterson found that large parcels zoned ½, 1, 2 and 10 units per acre ere selling for $5,800, $7,900, $13,700 and *$32,000* per acre, respectively. Con- erting these acre prices to per-lot values, the prices implied by the %, 1, 2 and 0 units per acre zoning are $11,600, $7,900, $6,850 and *$3,200,* respectively.

A second type of direct cost effect of development controls is the increase in he cost of lot preparation and home construction. Numerous estimates of the rice effects of subdivision and building code requirements are available, some etter than others. In a **1976** study of Jacksonville, Florida, the Urban Land nstitute [10] found that locally mandated changes in water system design and treet width requirements added $830 to the cost of producing a "finished" lot 1976 dollars). In an earlier study for the Kaiser Commission, Burns and Mittel- bach [11] estimated the inflationary impacts of excessive subdivision and zoning equirements at 2 to **4%** of the price of new housing. While it is difficult to differ- ntiate between necessary **and** excessive requirements, available evidence **sug-** gests that some cost reductions might be attainable by reducing subdivision standards. Short-term cost reductions are unlikely in the case of building codes, however, **as** most builders have fully integrated building code requirements into their production technologies.[3]

A third direct cost effect of development regulation is generated when local governments attempt to shift the public service costs to new development back to private builders. Traditionally, municipal governments have shouldered the pub- lic service costs of new construction. Recently, however, an increasing number of communities have begun to **impose** additional fees, taxes **and** land dedication requirements on project developers. This trend was particularly noticeable in California following the 1978 passage of Proposition 13, which limits home- owner property tax payments to 1% of assessed value. **A** recent survey of Bay Area communities [12] revealed substantial increases in development fees and taxes following Proposition **13.** For example, in 1976, prior to the passage of Proposition **13,** development, utility and impact fees averaged $1 121 for the standard single-family home. **By** 1979, mean fee levels, in nominal terms, had risen to $1907, an increase of 70%. After discounting for inflation, fees rose by some **35%. As** in the case of subdivision requirements it is difficult to determine when fees and charges are excessive. Charges that reflect the actual costs of providing public services to new development are reasonable, equitable and

desirable. However, in some instances, cost-shifting appears excessive—when revenues are used to provide services that benefit the general community.

The fourth direct effect of development regulation results from administrative delays associated with regulatory compliance. With the widespread use of fiscal and environmental assessments, particularly in California, the time required to obtain development approval has increased tremendously over the past decade. A national survey [13] of the time length of the development approval process found that in 1970, 72% of the developers interviewed obtained project approval in seven months or less. 97% obtained approval in on year or less. By 1975, only 15% of the survey respondents had obtained permits in less than Seven months, and only 42% obtained development approval in one year or less. To be sure, the blame for such delay rests as much with builders who prepare improper submissions, as with overzealous reviewers. Regardless of fault, however, delays in the development review process generate economic costs—costs generally borne by consumers. Delays result in increased land-holding and overhead costs, development loan interest costs, exposure to inflation and opportunity costs of tying up capital. In a 1978 Rice University study of Houston area builders, [14] the overall costs of approval delays were estimated to add between $388 and $596 to the per unit cost of new housing. In California, delays associated with California Environmental Quality Act compliance were estimated to add between 4 and 7% to the selling price of new units (1974) [15].

Indirect Effects

In addition to the direct cost effects of land use regulations, community control over residential development often confers significant monopoly power on developers and alters marketing and pricing decisions. Monopoly power allows builders to charge excess prices for housing and increased production costs may force developers to reorient residential projects to high-income markets.

Regulation establishes monopoly power in a variety of ways. By restricting developable land supplies, the potential for market entry and the possibility of increased competition are reduced. Studying the Edmonton, Canada, housing market, Cook [16] found substantial concentration among developers operating in the city's six restricted development areas, with the four largest builders supplying 64% of the single-family lots produced between September 1973 and August 1976. A closer inspection of the six citydesignated development areas indicates that each is controlled by one developer.

Land use regulations which rely on complex administrative procedures act as barriers to market entry. If the level of complexity is great, potential developers may be reluctant to enter a local market, particularly if they perceive that those builders who have already established good working relationships with local planners arc more likely to obtain development permission. A study of two San

Jose, California builders [17] found that between 1967 and 1976, after holding land and materials cost increases constant, and discounting for mandated increases in **housing** quality, the two builders had increased their profit margins by between 158 and 231% (constant 1976 dollars). The researchers concluded that such excess profits were partly the result of reduced competition.

The second type of indirect effect of land **use** regulation **is** the reorientation of residential projects. The previous discussion of monopoly suggests that developers may increase prices to merely match cost increases. However, there is **another** reason for rising prices. Often, builders find that project marketability declines as prices **rise.** By changing the product only slightly, many builders are able to reorient their projects toward higher-income consumers, a reorientation which increases profits. Development restrictions which limit residential densities and increase production costs often force builders to scrap **plans** for high-volume, affordable housing in favor of a more limited number of higher-priced units [18].

THE BAY AREA PERSPECTIVE

The production cost side is only half the development control story. The other half, as noted above, concerns the interplay of supply and demand; whether in the face of rising **housing** demand, development controls restrict the aggregate supply response, and in doing **so,** push housing prices upward. Although such a market **dynamic is** difficult to verify empirically (in part because of the aforementioned problems with identifying submarkets and pure-demand side effects), with respect to the San Francisco Bay Area, there **is** substantial evidence that such supply constraints are in fact contributing to the continuing climb of new and existing housing prices.

In 1978, the San Francisco Bay Area edged Washington, D.C. for the dubious distinction of having the highest housing prices of any metropolis in the United States. In 1981, the median sales **price** of a new home in the Bay Area **stood at** $114,000—a figure more than $30,000 above the national average, **and** representing a **269%** increase over a ten-year period. [19] At the Same time that prices have been rising, vacancy rates have been falling. According to a recent estimaie from the Association of Bay Area Governments, in 1981, the average Bay Area vacancy rate stands at roughly 2%—down from the **5%** vacancy rate of **only** five years ago. [20]

What combination of market factors explains these trends? Like **many** growing metropolitan regions, the Bay Area has faced considerable demand pressure from **growing** households **and** industries. The so-called baby boom generation has now reached prime house-buying age. **Changing** cultural **and** social values have dramatically increased the formation of households as more individuals seek separate residences. Employment growth and increased immigration *to* California and the Bay Area have further accelerated household growth. The

demand for housing is strong in the Bay Area, but it only partially explains rapid housing price inflation and high prices. The other key ingredient is insufficient supply.

Unlike other high growth Sunbelt regions, the Bay Area is, relatively speaking, in short supply of developable land. Extensive land development since World War II, the increasing use of growth management controls, more restrictive land use and environmental regulations, and the "go-slow" development posture created by the passage of Propositions 4 and 13 have significantly affected land conversion in the region. Despite the existence of what in absolute terms is an enormous supply of vacant land, much of this total cannot be developed because of rugged topography or enviromental fragility. Other vacant lands that could be developed are restricted from use by local land use controls. A 1975 inventory of land use recorded that of the region's 4.5 million acres, only 350,000 acres were vacant and "developable." [21] If only the acreage zoned for residential development and likely to be serviced is considered, the total shrinks to 161,800 acres, a number which at prevailing densities (8.7 units per acre), would accomodate some 1.4 million additional housing units. But unfortunately, as ABAG points out, residential densities are falling, and rather rapidly. If present land conversion trends continue, the projected 1990 regional housing demand will not be accomodated—there simply will not be enough land for residential development. [22]

Are such trends truly worrisome? After all, as vacant land supplies diminish, land prices can be expected to rise, signaling to developers and planners that land use intensities must also rise. Unfortunately, there now appear to be substantial and permanent forces within the San Francisco Bay Area which will prevent a move to higher housing densities. Among these forces:

The Rise of *Local Growth Controls:* The pro-growth attitude of most Bay Area communities in past decades has been replaced by a slow-growth posture, brought on by rising fiscal worries generated by Proposition 13. Cities that once relished being regional growth centers now view growth with much skepticism. With the new fiscal calculus of Proposition 13, single-family development usually generates higher public sector costs than revenues." This fact, in conjunction with a greater recognition of the environmental impacts of development, has led some communities to reduce the amount of land available for residential development. Coupled with the lack of developable land in older Bay Area cities, development opportunities are becoming scarce, and some builders are leapfrogging out to exurban agricultural areas.

Iobs, But No Housing: Another result of Proposition 13 has been that numerous communiites have altered their approach to land use pianning and zoning. Caught in a fiscal squeeze, many towns have stepped up efforts

to increase their tax base by attracting more commercial, office and light industrial development. But while attempting to attract economic development, most communities have not concomitantly adjusted their zoning to provide housing for additional employees. As a result, new employees, particularly those just migrating into the region, may find it increasingly difficult to purchase their own homes, *even assuming that currently high mortgage interest rates abate somewhat.*

Increased Development Fees and Charges: In addition to limiting development of fiscally "unprofitable" housing, most Bay Area communities have dramatically increased the fees and charges they levy an developers. A recent ABAG study found that total development fees for single-family homes range from $800 to nearly $6,000 per unit. [23] Crucially, the ABAG study reveals that the twenty-two communities charging the highest fees (ranging from $3,000 to $6,000) are all located in the developing suburban reaches of the Bay Area—communities, which not coincidentally, boast some of the region's more affordable housing.

How have these various factors affected housing supply? Exhibit 2 shows that region-wide, new housing production dropped from 46,235 units in 1977, to 38,472 units in 1978, to 33,763 units in 1979. In contrast to the Bay Area experience, statewide housing starts in 1978 and 1979 were well above 1976 levels. What is perhaps more alarming than the decline in regional housing starts is the fact that the greatest absolute 1977-1979 declines occurred in the three counties —Contra Costa, Santa Clara, and Sonoma—which together contain the majority of the region's developable land supply.

Falling residential densities, growth controls, job growth at the expense of housing development, and the "obstructionist" attitudes of citizens and communities toward new development—all of these factors are acting to reduce the supply of vacant land available to housing development. How are these trends likely to affect housing costs? Economic theory suggests that if the current regime of local land use and development control policies remains unchanged, land and housing prices alike will continue in an upward spiral, placing extreme burdens on low and moderate-income households and ultimately slowing the region's economic growth rate. Higher land and housing costs may also act to push up wage rates, as workers struggle to pay higher housing costs. Carried to their logical extreme, higher land and wage costs may reduce the Bay Area's attractiveness to business and industry. Such concerns, which may seem excessively "long run" to economists, are nonetheless very real to Bay Area civic and business leaders.

CONCLUDING COMMENTS

While it is widely agreed that land use regulations contribute to housing price inflation, little supporting empirical evidence is available. Although tentative, the results of this paper illustrate that density controls and land availability do systematically affect the price of new housing units. However, our research also indicates that the direct cost effects are not as great as some critics of land use controls allege. For example, according to econometic estimates of new housing prices, the combined effect of increasing development densities by one unit per acre, reducing development fees by 50%, and doubling supplies of vacant land–all drastic steps—would be to lower the sales price of a new home by $6,000. This estimate amounts to roughly 6% of the average price of a new Bay Area home in 1979. New homes prices in growing suburban communities are less sensitive to limits on development densities and vacant land supplies and slightly more sensitive to increasing development fees. Our results also support the contentions of suburban builders who report that planning and development fees are added to the price of new housing on a one-to-one basis. In other words, for every one dollar increase in fees, the list price of a new home increases by one dollar. However, we note that land costs are more important to builders, and accordingly, density limits become critically important in determining project selling prices and profit. To the extent that builders can distribute higher land costs, as well as infrastructure costs, over a greater number of constructed units, higher single-family housing densities are crucial for holding down selling prices while maintaining profit levels,

The importance of the suburban housing market in acting as a relief valve for Bay Area housing demand is implied by Exhibit 5. Although changes in supply do not greatly affect housing prices in the region as a whole, the flow of new units onto the market is a major determinant of housing prices in expanding suburban markets. For example, a 500-unit increase in the flow of new homes into a suburban market would imply a decline in all suburban home prices of nearly $6,000. Thus policies which greatly restrict new construction and/or densities in active suburban communities are found to be inflationary. A logical extension of this finding is that if local governments in the San Francisco Bay Area are committed to reducing housing costs, they should consider loosening density restriction or other controls which inhibit the flow of new housing onto the market.

It is important to be careful in drawing rigorous conclusions from the results of partially specified econometric models, particularly when the observation set consists of city averages instead of well-defined economic agents. And because the significance levels of the estimated development policy coefficients vary depending on how the models are specified, the link between development controls and higher home prices must still be regarded as unproven. Nonetheiess, the results presented here are surprising for their consistency, and their agreement

with expectations. They suggest that the housing price effects of pursuing restrictive growth control policies in expanding urban areas, far from being small and localized, are significant and widespread.

NOTES

1. Frequently, communities circumvent the intent of AB 884 by requiring builders to sign a waiver exempting the city from complying with AB 884.

2. Senate Bill (SB) 2853, was enacted by the legislature in 1980. It mandates that regional councils of government (COGs) allocate new housing construction to cities on the basis of projected growth and land availability. Initial allocations for the San Francisco Bay Area were to be published during the summer of 1981.

3. According to a recent survey by the National Association of Homebuilders, [37] when asked to list major construction problems, responding homebuilders listed building codes eighth–well behind increased labor, materials and land costs. Moreover, only 1.3% of those responding listed building codes as their "most Significant" construction-related problem.

4. Whether or not new residential construction does or does not "pay its own way" will depend on a number of factors, including the existence of excess capacity in public services, the level of demand for such services by new residents and prevailing tax rates. In California, where Proposition 13 limits yearly property tax payments to 1% of assessed value, municipalities continue to experience substantial revenue short-falls. In the San Francisco Bay Area, Proposition 13 has led numerous communities to examine the net fiscal costs of new development through the use of CRIS (Cost-Revenue Impact Study), a municipal finance model developed by the Association of Bay Area Governments. In most of the cities in which CRIS has beenused, new single-family development was found to generate insufficient tax revenues to cover the accompanying increase in public service costs.

5. The extent to which households trade between access to employment and land and housing prices is the basis of much of contemporary urban economics. For the basic exception, see Edwin S. Mills [33].

6. This argument, first offered by Tiebout (1956). is best presented in Wallace Oates [36].

7. Data were provided by Professor Kenneth Rosen, Director of the Center for Real Estate and Urban Economics, University of California, Berkeley.

8. The use of time-series dummy variables is not without drawback. Although we argue that the variation in new home prices attributable to increasingly stringent (across time) land use controls is far less than the price variation attributable *to* cross-community land policy differences, the time-series effect is not insignificant. By using single-time dummy variables (and thus lumping together the time-series variance of all the independent variables), we sacrifice the ability to identify precisely these time-series effects and bias the resulting yearly price indices.

An alternate method for estimating time-series hedonic price indices, one which partially obviates the problem of time-series dummy variables, has been suggested by Griliches [38], and more recently by Palmquist [39]. In the present case, the technique consists of:

> Estimating the New Housing Price Model for each sample year (1977, 1978, 1979) in both linear and logarithmic form.
>
> Inserting the mean values of the independent variables for the base year (1977) into the separate equations estimated for 1978 and 1979.

Comparing the estimated values of the dependent variable (NPRICE) for 1978 and 1979 to the base year 1977. The resulting ratios are quality-controlled time-series indices.

In the table below, the indices derived using the Griliches/Palmquist technique are compared with the hedonic indices derived through the use of time-series dummy variables. In neither the linear case or the logarithmic case does the Griliches/Palmquist index seem reliable. We offer two reasons for the discrepancy. First, the observationsare not individual home transactions (as Palmquist suggests is appropriate), but instead are city-wide averages. Second, the estimated coefficients vary widely when separate year models are attempted, in part because we lack a sufficient number of yearly observations.

Year	Time-Series Dummy Variable		Quality-Controlled Hedonic Index	
	Linear	Log	Linear	Log
1977	1.00	1.00	1.00	1.00
1978	1.16	1.26	1.33	1.98
1979	1.28	1.38	1.31	1.19

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